EXHIBIT 1

Site Cost Summary Report (with Markups)

System:

RACER Version: RACER® Version 11.3.18.0
Database Location: C:\Users\hhhoratio\Documents\RACER 11.3\RACER.mdb

Folder:

Folder Name: Meyner & Landis

Project:

ID: AM115
Name: Chemours Chambers Works Manufacturing Facility
Category: None

Location
State / Country: NEW JERSEY
City: NEW JERSEY STATE AVERAGE

Location Modifier	Default	User	Reason for changes
	1.210	1.210	

Options
Database: Modified System Costs
Cost Database Date: 2016
Report Option: Fiscal

Description Cost Estimate for Remediation Action

Site Cost Summary Report
(with Markups)

Site:

ID: AOC1
Name: Fluoroproducts
Type: AOC

Media/Waste Type

Primary: Groundwater
Secondary: Soil

Contaminant

Primary: Volatile Organic Compounds (VOCs)
Secondary: Semi-Volatile Organic Compounds (SVOCs)

Phase Names

- **Pre-Study** ☐
- **Study** ☐
- **Design** ☑
- **Removal/Interim Action** ☑
- **Remedial Action** ☑
- **Operations & Maintenance** ☑
- **Long Term Monitoring** ☑
- **Site Closeout** ☑

Documentation

Description: AOC 1, the Fluoroproducts Area, is located in the northwest section of the Chambers Works manufacturing area along the eastern bank of the Delaware River. This area of the site initially housed Plant 4, which was established by the DuPont Explosive Department to manufacture picric acid. Based on common processes, history, chemical use, and disposal practices, AOC 1 is subdivided into two distinct areas, which were built when Plant 4 closed: the former Alcohol Plant to the south, which is currently vacant, and the former Kinetic area to the north, which includes the current operating area producing fluoroproducts. The former Alcohol Plant, which was located in the southern portion of AOC 1, produced ethyl alcohol and later butyl alcohol, acetone, and isopropyl alcohol. The former Kinetic Area (later re-named the Fluoroproducts Area), which was located in the northern portion of AOC 1, was used for nitrating and sulfur black production, as well as fluoroproducts (Freon) production. Freon production began in 1930 and continued until the 1980s. Atleast six different Freon refrigerants were manufactured including Freon 11 (trichlorofluoromethane), Freon 12 (dichlorodifluoromethane), Freon 113 (1,1,2-trichloro-1,2,2,-trifluoroethane), Freon 114 (1,2-dichlorotetrafluoroethane), Freon 22 (chlorodifluoromethane), and Freon 21 (dichlorofluoromethane). Common organics that were used include carbon tetrachloride, chloroform, and PCE.

The current operations in AOC 1 include the manufacture of three products: HFC-125, HFC-227, and PFC-116. Additional products HFC-23, Zyron 8020, and HFC-236 are managed in the area. Hydrofluoric acid is used as a raw material in chemical processes.
Wastewater is discharged into collection tanks and pumped to the WWTP via overhead pipeline. Twenty-one occupied structures have been identified in the

Site Cost Summary Report
(with Markups)

Fluoroproducts Area. Of these, five structures (Buildings K-21, K-24, K-29, K-37, and 857) have confirmed continuous occupancy. Other areas within this AOC consist of parking lots, abandoned foundations and abandoned storage tanks. Hard surfaces (consisting of gravel, concrete and asphalt with some minor areas of grass) cover the area where buildings are not present.

AOC 1 contains the following SWMUs: Portions of SWMU 17/17A Process Water Ditch System (A Ditch), 20 Ethyl Chloride Incinerator, 26 Freon Spent Catalyst Storage Area, 33 Manhattan Project Area, 34 Gypsum Disposal Area, 35 Freon Disposal Impoundment, 39-3 USTs, 55-4 Fill Deposition Area, Portions of SWMU 56A Historical Process Water Ditch System (B Ditch), 59 Disposal Area V.

In AOC 1, a multi-component, comingled plume consisting of mainly fluroproducts related chemicals such as Freon originates from residual DNAPL across the AOC in a smear zone caused by 46 years of smearing product.. Major contaminants of concern include: Trichlorotrifluoromethane (Freon-113), Chlorobenzene, Tetrachloroethene, Trichlorofluoromethane (Freon-11), Chloroform, 4-chloroaniline, 1,2-Dichlorobenzene, CarbonTetrachloride, and metals including antimony, arsenic, beryllium, and lead. DNAPL sample (10,000 ppm) consisted of 19% 1,4 dichlorobenzene, 15% Freon-113, 8% 1,2-dichlorobenzene, 3.6% xylene, 1.3% PCE, 1% toluene and over 0.1% of each of the following SVOCs 1,2,4-trichlobenzene, napthalene and over 2000 mg/kg of PCBs,

B-Aquifer impact at 20 ft thickness x AOC acreage per reports and Figure 7-28.

Support Team: The TBLS Group, LLC.

References:
2006 Preliminary Assessment Report, Dupont Corporate Remediation Group (CRG)
2006 Site Investigation Report for PFOA, CRG,
2007 Site Investigation Report Addendum for Perfluorooctanoic Acid, CRG
2010 Perimeter Investigation Report, URS.
2011 Perfluorooctanoic Acid Groundwater Investigation Report Addendum II, URS
2012 Remedial Action Screening Report, Geosyntec.
2013 RCRA Facility Investigation Data Gap Sampling Plan. URS
2013 Interior Investigation Technical Memorandum, URS
2014 Comprehensive RCRA Facility Investigation Report, URS
2014 AOC 1 Fluoroproducts Pilot Test, GeoCleanse
2014 Fact Sheet, CRG

Estimator Information

Estimator Name: Jeffrey Andrilenas
Estimator Title: EVP
Agency/Org./Office: The TBLS Group LLC
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Telephone Number: (973) 750-1500
Email Address: jeffa@thetblsgroup.com
Estimate Prepared Date: 11/17/2016

Estimator Signature: _____ **Date:** 2 Dec 2016

Site Cost Summary Report
(with Markups)

Reviewer Information

Reviewer Name: Paul Scian
Reviewer Title: Principal Analyst/Hydrogeologist
Agency/Org./Office: The TBLS Group LLC
Business Address: 25 South Road
Telephone Number: (973) 750-1500, ext 2
Email Address: pauls@thetblsgroup.com
Date Reviewed: 12/01/2016

Reviewer Signature: _____ **Date:** 2 Dec 2016

Site Cost Summary Report
(with Markups)

Phase	Direct Cost	Markups	Total Cost
Design	$4,310,139	$0	$4,310,139
Remedial Action	$37,747,843	$26,095,532	$63,843,376
Operations & Maintenance	$28,943,925	$22,989,755	$51,933,679
Site Closeout	$746,364	$798,840	$1,545,204
Total Site Cost	$71,748,270	$49,884,127	$121,632,397

EXHIBIT 2

Site Cost Summary Report (with Markups)

System:

RACER Version: RACER® Version 11.3.18.0
Database Location: C:\Users\hhhoratio\Documents\RACER 11.3\RACER.mdb

Folder:

Folder Name: Meyner & Landis

Project:

ID: AM115
Name: Chemours Chambers Works Manufacturing Facility
Category: None

Location
State / Country: NEW JERSEY
City: NEW JERSEY STATE AVERAGE

Location Modifier	Default	User	Reason for changes
	1.210	1.210	

Options
Database: Modified System Costs
Cost Database Date: 2016
Report Option: Fiscal

Description Cost Estimate for Remediation Action

Site Cost Summary Report
(with Markups)

Site:

ID: AOC2
Name: TEL
Type: AOC

Media/Waste Type

Primary: Groundwater
Secondary: Soil

Contaminant

Primary: Volatile Organic Compounds (VOCs)
Secondary: Semi-Volatile Organic Compounds (SVOCs)

Phase Names

Pre-Study ☐
Study ☐
Design ☑
Removal/Interim Action ☑
Remedial Action ☑
Operations & Maintenance ☑
Long Term Monitoring ☑
Site Closeout ☑

Documentation

Description: AOC 2, the former TEL (tetraethlyl lead) Area, is located in the western section of the Chambers Works manufacturing area along the eastern bank of the Delaware River. The TEL area manufactured motor fuel anti-knock compounds (MFACs) using TEL and related compounds from 1923 to 1991. MFAC was added to gasoline to increase the octane rating and reduce engine knocking. MFA C was a mixture of chemicals that could include TEL, TML, TMEL, EDB, 1,2- EDC, sodium-lead alloy, and red dye. The production of MFAC resulted in the generation of various lead-bearing wastes that were managed on-site. Most of the TEL area operations were shut down on May 31, 1991. Decontamination and demolition of the site structures occurred between 1991 and 2001. Plant production of TEL started in August 1923. From 1924-1935, five new plants (A, B, C, D, and E Plant) were constructed within AOC 2 to support TEL production. In addition, ethyl chloride was stored in several storage tanks in the AOC. By 1957, the production for the Antiknocks area was 194 million pounds per year. In 1973, the EPA began to regulate the lead content of domestic gasoline. This resulted in a gradual decline in the production of TEL at the site, which ultimately led to the business shutdown in 1991.

Aqueous streams from the TEL area were combined with water run-off from the production area and pumped to an accelerator clarifier for lead recovery. The clarifier required pH adjustment with HCl due to the high pH of the wastewater The adjustment
facilities precipitated inorganic lead salts, which were dewatered with a centrifuge. Solids recovered in the centrifuge were directed to a spray furnace for lead recovery. The clarifier overflow was discharged into the C Settling Basin (SWMU 16) to which sodium

Site Cost Summary Report
(with Markups)

borohydride was added. The overflow from the basin was directed to the plant wastewater treatment facility while the dredged solids were centrifuged.

Currently, there are no active operations within AOC 2. The area consists mostly of abandoned foundations (some of which are used for drum storage), abandoned and cleaned storage tanks and the WWTP air stripper, which was shut down and
decommissioned. At this time, two structures, Buildings 63 and 85, have continuous occupancy. Gravel, concrete, or asphalt covers the entire area where buildings are not present. Limited patches of vegetation also exist.

Comingled plumes with 4-chloroaniline core associated with the 464 Plant, sharp EDB plume to the west, large EDB and Freon 113 DNAPL source zone. Other contaminants at elevated levels present include 1,2-Dichloroethane, Benzene, Chlorobenzene, aniline, Tetraethyl Lead, Antimony, Arsenic, Beryllium, Lead, and Chromium among others.

A Cut-off wall has been installed on the west edge of AOC 2 as part of efforts to isolate groundwater contaminants from the Delaware River.

DNAPL/NAPL: Evaluation of the exceedances and probable and potential DNAPL source zones in the B aquifer indicate that B aquifer groundwater is impacted beneath the entire AOC 2 area based on Figures provided. The current IWS likely creates more co-mingling of plumes from multiple source areas toward IWS pumping wells located in the site interior. Residual DNAPL, as well as DNAPL diffused into finer-grained units, will likely continue to impact B aquifer groundwater. B-Aquifer impact at 20 ft thickness x AOC acreage per reports and Figures 7-27, 28, 40, among others.However, groundwater plumes are co-mingled, heterogeneous, and extend beyond the AOC 2 boundaries. Potential releases (especially from waste ditches) were not limited by AOC boundaries, and the current IWS likely creates more comingling of plumes from multiple source areas toward IWS pumping wells located in the site interior. Residual DNAPL, as well as DNAPL diffused into finer-grained units, will likely continue to impact B aquifer groundwater. Impacts to the C aquifer are far less in terms of the magnitude of groundwater concentrations and the margins of exceedances and are also limited to the northwestern half of the AOC. In general, the D aquifer is less impacted than the C aquifer.

Support Team: The TBLS Group, LLC

References:
2006 Preliminary Assessment Report, Dupont Corporate Remediation Group (CRG)
2006 Site Investigation Report for PFOA, CRG,
2007 Site Investigation Report Addendum for Perfluorooctanoic Acid, CRG
2010 Perimeter Investigation Report, URS.
2011 Perfluorooctanoic Acid Groundwater Investigation Report Addendum II, URS
2012 Remedial Action Screening Report, Geosyntec.
2013 RCRA Facility Investigation Data Gap Sampling Plan. URS
2013 Interior Investigation Technical Memorandum, URS
2014 Comprehensive RCRA Facility Investigation Report, URS
2014 AOC 1 Fluoroproducts Pilot Test, GeoCleanse
2002, 2014 Fact Sheet, CRG
Second Semester 2015 NPDES/DGW Report, 2016, AECOM

Estimator Information

Site Cost Summary Report
(with Markups)

Estimator Name: Jeffrey Andrilenas
Estimator Title: EVP
Agency/Org./Office: The TBLS Group LLC
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Email Address: jeffa@thetblsgroup.com
Estimate Prepared Date: 12/01/2016
Estimator Signature: _____ **Date:** 4 Dec 2016

Reviewer Information

Reviewer Name: Paul Scian
Reviewer Title: Principal Analyst/Hydrogeologist
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Email Address: pauls@thetblsgroup.com
Date Reviewed: 12/04/2016
Reviewer Signature: _____ **Date:** 4 Dec 2016

Site Cost Summary Report
(with Markups)

Phase	Direct Cost	Markups	Total Cost
Design	$3,592,377	$0	$3,592,377
Remedial Action	$33,258,274	$23,859,308	$57,117,582
Operations & Maintenance	$30,483,745	$23,765,509	$54,249,254
Site Closeout	$753,656	$844,118	$1,597,774
Total Site Cost	$68,088,053	$48,468,935	$116,556,987

EXHIBIT 3

Site Cost Summary Report (with Markups)

System:

RACER Version: RACER® Version 11.3.18.0
Database Location: C:\Users\hhhoratio\Documents\RACER 11.3\RACER.mdb

Folder:

Folder Name: Meyner & Landis

Project:

ID: AM115
Name: Chemours Chambers Works Manufacturing Facility
Category: None

Location
State / Country: NEW JERSEY
City: NEW JERSEY STATE AVERAGE

Location Modifier	Default	User	Reason for changes
	1.210	1.210	

Options
Database: Modified System Costs
Cost Database Date: 2016
Report Option: Fiscal

Description Cost Estimate for Remediation Action

Site Cost Summary Report (with Markups)

Site:

ID: AOC3
Name: Jackson Labs
Type: AOC

Media/Waste Type

Primary: Groundwater
Secondary: Soil

Contaminant

Primary: Volatile Organic Compounds (VOCs)
Secondary: Semi-Volatile Organic Compounds (SVOCs)

Phase Names

- **Pre-Study** ☐
- **Study** ☐
- **Design** ☑
- **Removal/Interim Action** ☑
- **Remedial Action** ☑
- **Operations & Maintenance** ☑
- **Long Term Monitoring** ☑
- **Site Closeout** ☑

Documentation

Description: AOC 3, the Jackson Labs Area, is located in the southwest corner of the Chambers Works manufacturing area. AOC 3 was subdivided into two sub-areas based on process history, chemical use and disposal practices. These are the Labs Area (consisting of the Jackson Laboratory and the Technical Laboratory) and the Semi-Works area. Production began in 1917 with the construction of the Jackson Laboratory and the Technical Laboratory for R&D activities. Initially, R&D activities were focused on the dye business, but grew rapidly to support other products, including petroleum additives, synthetic rubber (Neoprene), Freon, plasticizers, Teflon®, Nomex, and Kevlar. Product formulations and manufacturing processes were developed in the laboratories and later pilot-tested in the Semi-Works area if the development showed promise. Historical records indicate that nearly every chemical that was ever used or produced in any operating area of the Chambers Works was tested in the laboratories at some point (CRG, 2006). Process waste from the buildings in the laboratory area was historically conveyed to the adjacent process waste ditch and is currently collected in waste sumps and pumped via overhead pipeline to the on-site WWTP. Several of the buildings in the Labs area were demolished between 1990 and 2000, and most of the remaining buildings are currently vacant.
The Semi-Works operations began in the early 1920s and included process development and pilot-scale production of dye formulations and other products developed by the Jackson Labs R&D department. Pilot testing was conducted in these buildings to troubleshoot the manufacturing process prior to large-scale production in other areas of the site. Product formulations and processes yielding successful test runs were relocated to other operating areas of the Chambers Works for large-scale production if there was a market for large quantities of the product. In many cases, the Semi-Works operations generated

Site Cost Summary Report
(with Markups)

quantities sufficient to meet market demand and, for that reason, continued producing products for an extended period of time. The Semi-Works area currently contains three operating process buildings that produce chemical intermediates for the elastomers business at the site.
Currently, the Semi-Works area of AOC 3 is being used for manufacturing by PCL elastomers business (PCL West) chemical intermediates area. The PCL West area consists of operating process buildings, support buildings, and office space or buildings
used for storage or maintenance shops. Over 25 occupied structures have been identified in AOC 3 mainly in the PCL West area. Of these, seven structures (1089, J-26, J-27, J-30, J-73, 603, and 1128) have confirmed continuous or intermittent occupancy. Most of the buildings in the Jackson Labs area are idle, and many of the buildings have been abandoned but not demolished. Most of the area is hard surfaces consisting of gravel, concrete or asphalt along with some minor landscaped areas near building entrances.

SWMUs included in the Jackson Labs AOC include: SWMU 6 Landfill II, Portions of SWMU 17/17A Process Water Ditch System (A Ditch), SWMU 25 Lead Flue Dust and Lead Furnace Slag Storage Area, SWMU 39-2 UST, Portions of SWMU 56A Historical Process Water Ditch System (B Ditch), Portions of SWMU 57 Antiknocks Area.

Co-mingled Freon and 1,2 DCB plumes with DNAPL. Main contaminants of concern include Freon-113, 1,2 Dichlorobenzene, Chlorobenzene, Nitrobenzene, Aniline, 4-chloroaniline, 1,2,4-Trichlorobenzene, Tetrachloroethene (PCE), Trichloroethene (TCE), Benzene, as well as antimony, arsenic, beryllium, lead and chromium. B-Aquifer impact at 20 ft thickness x AOC acreage per reports and Figures 7-27, 28, 40, among others.

Support Team: The TBLS Group, LLC

References: 2006 Preliminary Assessment Report, Dupont Corporate Remediation Group (CRG)
2006 Site Investigation Report for PFOA, CRG,
2007 Site Investigation Report Addendum for Perfluorooctanoic Acid, CRG
2010 Perimeter Investigation Report, URS.
2011 Perfluorooctanoic Acid Groundwater Investigation Report Addendum II, URS
2012 Remedial Action Screening Report, Geosyntec.
2013 RCRA Facility Investigation Data Gap Sampling Plan. URS
2013 Interior Investigation Technical Memorandum, URS
2014 Comprehensive RCRA Facility Investigation Report, URS
2014 AOC 1 Fluoroproducts Pilot Test, GeoCleanse
2014 Fact Sheet, CRG

Estimator Information

Estimator Name: Jeffrey Andrilenas
Estimator Title: EVP
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Business Address: 25 South Road
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Email Address: jeffa@thetblsgroup.com
Estimate Prepared Date: 11/17/2016

Estimator Signature: _____ **Date:** 2 Dec 2016

Site Cost Summary Report
(with Markups)

Reviewer Information

Reviewer Name: Paul Scian
Reviewer Title: Principal Analyst/Hydrogeologist
Agency/Org./Office: The TBLS Group LLC
Business Address: 25 South Road
Telephone Number: (973) 750-1500, ext 2
Email Address: pauls@thetblsgroup.com

Date Reviewed: 12/01/2016

Reviewer Signature: Paul Scian **Date:** 2 Dec 2016

Site Cost Summary Report
(with Markups)

Phase	Direct Cost	Markups	Total Cost
Design	$2,404,145	$0	$2,404,145
Remedial Action	$24,829,777	$19,116,055	$43,945,832
Operations & Maintenance	$20,857,387	$16,250,736	$37,108,123
Site Closeout	$642,911	$734,526	$1,377,436
Total Site Cost	$48,734,220	$36,101,316	$84,835,536

EXHIBIT 4

Site Cost Summary Report
(with Markups)

System:

RACER Version: RACER® Version 11.3.18.0
Database Location: C:\Users\hhhoratio\Documents\RACER 11.3\RACER.mdb

Folder:

Folder Name: Meyner & Landis

Project:

ID: AM115
Name: Chemours Chambers Works Manufacturing Facility
Category: None

Location
State / Country: NEW JERSEY
City: NEW JERSEY STATE AVERAGE

Location Modifier	Default	User	Reason for changes
	1.210	1.210	

Options
Database: Modified System Costs
Cost Database Date: 2016
Report Option: Fiscal

Description Cost Estimate for Remediation Action

Site Cost Summary Report
(with Markups)

Site:

ID: AOC4
Name: Aramids
Type: AOC

Media/Waste Type

Primary: Groundwater
Secondary: Soil

Contaminant

Primary: Volatile Organic Compounds (VOCs)
Secondary: Semi-Volatile Organic Compounds (SVOCs)

Phase Names

- **Pre-Study** ☐
- **Study** ☐
- **Design** ☑
- **Removal/Interim Action** ☑
- **Remedial Action** ☑
- **Operations & Maintenance** ☑
- **Long Term Monitoring** ☑
- **Site Closeout** ☑

Documentation

Description: AOC 4, the Aramids Area, is located in the northwest-central portion of the Chambers Works manufacturing area (see Figure A-1). The Aramids Area is divided into three subareas based on common manufacturing and disposal practices, history, and chemical use. These areas are the General Shops/Storage area, the Parking Lot/Aramids area, and one of the Manhattan Project buildings (SWMU 33). Aramids area is 23.5 acres and Period of Use: Pre-1917 – to date Remedial Action: Remedial actions were completed at SWMUs 17, 39-6, and 56A.

AOC 4 contains, in whole or in part, several individual SWMUs. The SWMUs and their descriptions are listed below. Portions of SWMU 17/17A Process Water Ditch System (A Ditch), Portions of SWMU 33 Manhattan Project Areas, 39-6 UST Portions of SWMU 55-4 Chambers Works Area of Fill Deposition, Portions of SWMU 56A Historical Process Water Ditch System (B Ditch).

Soil Contamination: VOCs (14 locations), SVOCs (14 locations), Metals (14 locations), Benzo(a)anthracene, Benzo(b)fluoranthene Benzo(k)fluoranthene, Benzo(a)pyrene, Dibenz(a,h)anthracene, Indeno(1,2,3-cd)pyrene, Naphthalene, Arsenic, Lead. Soil exceedances within AOC 4 are localized and within areas that have sufficient ground cover to prevent exposure.

Groundwater in AOC 4 contains constituents above NJGWIIA with the B aquifer having the highest concentrations. In general, concentrations decrease with depth in the lower aquifers. B Aquifer:VOCs (21 locations), SVOCs (12 locations), Metals (40 locations), Benzene, Chlorobenzene, 1,2-Dichloroethane, Aniline, Benzo(a)anthracene, 4-Chloroaniline, Aluminum, Arsenic, Lead, Total

Site Cost Summary Report
(with Markups)

PCBs, 4,4'-DDD, C Aquifer: Tetrachloroethene, 4-Chloroaniline. D Aquifer: 1, 2-Dichloroethane, 4-Chloroaniline.
In AOC 4, probable and potential DNAPL source zones were identified for the B aquifer. No potential DNAPL source zones were identified for the C aquifer. Evaluation of the exceedances and probable and potential DNAPL source zones in the B aquifer indicate that B aquifer groundwater is impacted beneath the entire AOC 4 area. Groundwater plumes are co-mingled, heterogeneous, and extend beyond the AOC 4 boundaries. Potential releases (especially from waste ditches) were not limited by
AOC boundaries, and the current IWS likely creates more co-mingling of plumes from multiple source areas toward IWS pumping wells located in the site interior. Residual DNAPL, as well as DNAPL diffused into finer-grained units, will likely continue to impact B aquifer groundwater. Impacts to the C aquifer are far less in terms of the magnitude of groundwater concentrations and the margins of exceedances. In general, the D aquifer is less impacted than the C aquifer.

B-Aquifer impact at 20 ft thickness x AOC acreage per reports and Figures 7-27, 28, 40, among others.

Support Team: The TBLS Group

References:
CRG. 2007. Site Investigation Report Addendum for Perfluorooctanoic Acid. DuPont
Chambers Works, Deepwater, New Jersey.
CRG. 2006. Preliminary Assessment Report. DuPont Chambers Works Complex,
Deepwater, New Jersey.
CRG. 2006. Site Investigation Report for Perfluorooctanoic Acid. DuPont Chambers
Works, Deepwater, New Jersey.
Geosyntec Consultants, Inc. 2012. Perimeter Area (AOCs 1, 2, & 3) Remedial Action
Selection Report (RASR). DuPont Chambers Works, Deepwater, New Jersey.
URS. 2014. Comprehensive RCRA Facility Investigation Report. DuPont Chambers
Works Complex, Deepwater, New Jersey.
URS. 2014. Vapor Intrusion Remedial Investigation Work Plan, DuPont Chambers
Works, Deepwater, New Jersey.
URS. 2013. RCRA Facility Investigation Data Gap Sampling Plan. DuPont Chambers
Works, Deepwater, New Jersey.
URS. 2013. Interior Investigation Technical Memorandum. DuPont Chambers Works,
Deepwater, New Jersey.
URS. 2011. Perfluorooctanoic Acid Groundwater Investigation Report Addendum II.
DuPont Chambers Works, Deepwater, New Jersey.
URS. 2010. Perimeter Investigation Report. DuPont Chambers Works Site, Deepwater,
New Jersey. August 2010.

Estimator Information

Estimator Name: Jeffrey Andrilenas
Estimator Title: EVP
Agency/Org./Office: The TBLS Group LLC

Site Cost Summary Report
(with Markups)

Business Address: 25 South Road
Telephone Number: (973) 750-1500
Email Address: jeffa@thetblsgroup.com
Estimate Prepared Date: 11/17/2016

Estimator Signature: _____ **Date:** 2 Dec 2016

Reviewer Information

Reviewer Name: Paul Scian
Reviewer Title: Principal Analyst/Hydrogeologist
Agency/Org./Office: The TBLS Group LLC
Business Address: 25 South Road
Telephone Number: (973) 750-1500, ext 2
Email Address: pauls@thetblsgroup.com
Date Reviewed: 12/01/2016

Reviewer Signature: _____ **Date:** 2 Dec 2016

Site Cost Summary Report (with Markups)

Phase	Direct Cost	Markups	Total Cost
Design	$2,578,501	$0	$2,578,501
Remedial Action	$22,957,010	$15,033,933	$37,990,943
Operations & Maintenance	$16,642,964	$12,721,280	$29,364,244
Site Closeout	$704,489	$777,965	$1,482,454
Total Site Cost	$42,882,964	$28,533,178	$71,416,142

EXHIBIT 5

Site Cost Summary Report (with Markups)

System:

RACER Version: RACER® Version 11.3.18.0
Database Location: C:\Users\hhhoratio\Documents\RACER 11.3\RACER.mdb

Folder:

Folder Name: Meyner & Landis

Project:

ID: AM115
Name: Chemours Chambers Works Manufacturing Facility
Category: None

Location
State / Country: NEW JERSEY
City: NEW JERSEY STATE AVERAGE

Location Modifier	Default	User	Reason for changes
	1.210	1.210	

Options
Database: Modified System Costs
Cost Database Date: 2016
Report Option: Fiscal

Description Cost Estimate for Remediation Action

Site Cost Summary Report
(with Markups)

Site:

ID: AOC5
Name: Historical Basins & Ditches
Type: AOC

Media/Waste Type

Primary: Groundwater
Secondary: Soil

Contaminant

Primary: Volatile Organic Compounds (VOCs)
Secondary: Semi-Volatile Organic Compounds (SVOCs)

Phase Names

- **Pre-Study** ☐
- **Study** ☐
- **Design** ☑
- **Removal/Interim Action** ☑
- **Remedial Action** ☑
- **Operations & Maintenance** ☑
- **Long Term Monitoring** ☑
- **Site Closeout** ☑

Documentation

Description: AOC 5, the historical basin footprint and ditches, is located in the Chambers Works manufacturing area south of the remediated Basins. Size of Unit: 31.8 acres. Period of Use: Pre-1940 – Present Day. In addition to the historical basin footprint and ditches, AOC 5 includes the following sub-areas: SWMUs 55-1 and 55-3, a portion of the Aramids Area parking lot, and the Triangle Engineering and Bulk Storage. Before 1919, the northeastern portion of AOC 5 was associated with a portion of the Carneys Point Works Plant 3 and included the powerhouse, main office, and various operating buildings, shops, and associated structures. These buildings were removed around 1920, leaving behind only foundations. Historically, surface water flowed in a stream named Whopping John Creek from the southeastern border of the site, through SWMU 8, the Basin area (which included the current AOC 5), and finally out to the Delaware River. Before 1970, the Basin area (including AOC 5) was a low-lying marsh area. Process water, non-contact cooling water, and stormwater runoff flowed through the PWDS (SWMU 17), into the basins, and then discharged to the Delaware River. In the 1970s, the A, B, and C Basins were constructed. A three-acre basin (C Basin) was constructed in the western portion of the area to act as a settling basin for process water generated by the TEL production area. In the mid-1970s, a dike was constructed to form A and B Basins. The Basin complex (SWMUs 14, 15, and 16) has been remediated and is not part of this AOC. Currently, AOC 5 has been filled in and is either paved or covered with gravel with sections of SWMU 56A and 17 also present. SWMU 56 and portions of SWMU 17 that have been remediated and the DNB storage tank are also located within this AOC. Two historical fill areas, SWMUs 55-1 and 55-3, are located within this AOC. A portion of the Aramids Area is also located within this AOC. This consists of a parking lot from the 1940s until the mid-1970s, when portions of the current

Site Cost Summary Report
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Aramids operations slowly expanded from the east toward the west. The building located within the AOC boundary is the packaging area (Building 1182). The Engineering and Bulk Storage Areas served as support areas to the Triangle Intermediates Area as well as the site in general. No products were created at these locations. The Engineering Area contained buildings used to maintain the narrow gauge railroad used to haul products at the site. This area is still used as a support area to the site. Buildings present today include the Car Repair Shop, Change House, Mechanical Instrument Shop & Office, Scale House, and storage buildings. The Bulk Storage area was identified based on an interview with a site retiree. It was reported that tanker trucks and train cars were staged in this area to serve as bulk storage and/or loading and unloading for operation at the Hydrogen Reduction intermediate process. Approximately 100,000 pounds of orthochloronitrobenzene was spilled at this area in the mid- 1980s. The product was removed; however, no post-removal sampling or impact evaluation was undertaken at this area. Currently, the area consists of existing buildings and hard surface consisting of gravel, concrete, or asphalt. Near the basin Spot 321, a wet marshy area with a small pond in the center exists.

AOC 5 contains, in whole or in part, several individual SWMUs: 12 WWTP Storage Pad, Portions of SWMU 17/17A Process Water Ditch System (A Ditch), Portions of SWMU 18 WWTP, 18A WWTP Pump Pit, 27 Oil/Water Separator, 55-1 Chambers Works Area of Fill Deposition 1, 55-3 Chambers Works Area of Fill Deposition 3, Portions of SWMU 56 Orthodichlorobenzene in B Ditch, Portions of SWMU 56A Historical Process Water Ditch System (B Ditch), 58 Former Sludge Pit.Remedial actions were completed at SWMUs 12, 17, 56A, and 56.

Soil Contamination: The evaluation of constituents within AOC 5 that exceeded applicable criteria was based on the results of numerous investigations. Soil data collected within the extent of AOC 5 indicate exceedances of NJNRDCSRS for VOCs, SVOCs, metals, and Total PCBs. VOCs (53 locations), SVOCs (47 locations), Metals (48 locations), Pesticides/Total PCBs (16 locations) with specific contaminants including: 1,4-Dichlorobenzene, Benzene, 2,4-Dinitrotoluene, 2,6-Dinitrotoluene, Benzo(a)anthracene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Bis(2-ethylhexyl)phthalate, Dibenz(a, h)anthracene, Indeno(1,2,3- cd)pyrene, Naphthalene, Antimony, Arsenic, Lead, Total PCBs.

Groundwater Contamination: Groundwater samples were collected at several locations from the B, C, and D aquifers, respectively within the AOC 5 boundary. No groundwater samples were collected from the E aquifer as part of these investigations. roundwater in AOC 5 contains constituents above NJGWIIA with the B aquifer having the highest concentrations. In general, concentrations decrease with depth in the lower aquifers. "Other" category is defined as constituents with the greatest margin of exceedance that are relatively infrequently encountered at locations throughout the manufacturing area.

B Aquifer Exceedances: VOCs (20 locations), SVOCs (19 locations), Metals (21 locations), Pesticides/Total PCBs (8 locations), PFOA/PFOS (2 locations), with specific contaminant exceedance including: Benzene, Chlorobenzene, Tetrachloroethene, 1,2-Dibromoethane(EDB), Aniline, Hexachlorobenzene, 2-Naphthylamine, 2,4-Dinitrotoluene, 4-Chloroaniline, Aluminum, Lead, Aldrin Alpha-BHC, Total PCBs, PFOA/PFOS.

C Aquifer Exceedances: VOCs (2 locations), SVOCs (2 locations), Metals (2

Site Cost Summary Report
(with Markups)

locations), Pesticides/Total PCBs, (1 location), PFOA/
PFOS (1 location) with specific contaminant exceedances including: Benzene, PFOA/(PFOS.

NAPL/DNAPL: As part of the Comprehensive RFI Report assessment of soil and groundwater, a multiple lines-of-evidence approach was used to identify DNAPL source zones across the manufacturing area. In AOC 5, probable and potential DNAPL source zones were identified for the B aquifer. Analyses of two DNAPL samples collected at locations within AOC 5 indicate that the highest mass fraction of the samples consisted of chlorinated benzenes, nitroaromatics, BTEX, and organo lead.
Evaluation of the exceedances and probable and potential DNAPL source zones in the B aquifer indicate that B aquifer groundwater is impacted beneath the entire AOC 5 area. Groundwater plumes are co-mingled, heterogeneous, and extend beyond the AOC 5 boundaries. Potential releases (especially from waste ditches) were not limited by AOC boundaries, and the current IWS likely creates more co-mingling of plumes from multiple source areas toward IWS pumping wells located in the site interior. Residual DNAPL, as well as DNAPL diffused into finer-grained units, will likely continue to impact B aquifer groundwater. Impacts to the C aquifer are far less in terms of the magnitude of groundwater concentrations and the margins of exceedances. In general, the D aquifer is less impacted than the C aquifer. B-Aquifer impact at 20 ft thickness x AOC acreage per reports and Figures 7-27, 28, 40, among others.

Vapor Intrusion: Sub-slab soil gas samples were collected from Building 84 within AOC 5 during the most recent 2014 VI Investigation. Three soil gas samples were collected during the investigation. Trichloroethene was detected in one the soil gas sample just above NJNRSGSLs.

Long-term Monitoring: Groundwater monitoring is performed under several programs at Chambers Works. Monitoring wells within the AOC 5 boundary include those to support Closure and Post-Closure Monitoring Program for the A, B, and C Basins and PFOA Monitoring Program. Groundwater monitoring data are reported semiannually in the DGW reports. AOC 5, also known as the Historical Basin Footprint and Ditches Area, is a 31.8-acre area that contains, in whole or in part, numerous SWMUs. Extensive investigations as part of the RFI program for SWMUs as well as follow-on investigation for AOC 5, detected the presence of constituents in soil or groundwater that are consistent with past operations and disposal practices. Soil within AOC 5 contains constituents above NJNRDCSRS and NJIGWSRS. Under current conditions, the surface cover is diverse (i.e., asphalt, concrete, gravel, foundations, and limited vegetation near the basins) and provides a barrier to prevent worker exposure. In addition, institutional controls (i.e., plant security, work permits, orientations, and the PPE requirement) are in place to further eliminate potential exposure to underlying soil. Groundwater beneath AOC 5 contains constituents above NJGWIIA. As indicated, groundwater is controlled by the IWS and is evaluated on a site-wide basis.

Support Team: The TBLS Group

References: CRG. 2007. Site Investigation Report Addendum for Perfluorooctanoic Acid. DuPont
Chambers Works, Deepwater, New Jersey.
CRG. 2006. Preliminary Assessment Report. DuPont Chambers Works Complex,
Deepwater, New Jersey.
CRG. 2006. Site Investigation Report for Perfluorooctanoic Acid. DuPont

Site Cost Summary Report
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Works, Deepwater, New Jersey.
Geosyntec Consultants, Inc. 2012. Perimeter Area (AOCs 1, 2, & 3) Remedial Action
Selection Report (RASR). DuPont Chambers Works, Deepwater, New Jersey.
URS. 2014. Comprehensive RCRA Facility Investigation Report. DuPont Chambers
Works Complex, Deepwater, New Jersey.
URS. 2014. Vapor Intrusion Remedial Investigation Work Plan, DuPont Chambers
Works, Deepwater, New Jersey.
URS. 2013. RCRA Facility Investigation Data Gap Sampling Plan. DuPont Chambers
Works, Deepwater, New Jersey.
URS. 2013. Interior Investigation Technical Memorandum. DuPont Chambers Works,
Deepwater, New Jersey.
URS. 2011. Perfluorooctanoic Acid Groundwater Investigation Report Addendum II.
DuPont Chambers Works, Deepwater, New Jersey.
URS. 2010. Perimeter Investigation Report. DuPont Chambers Works Site, Deepwater,
New Jersey. August 2010.

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Reviewer Information

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Site Cost Summary Report
(with Markups)

Phase	Direct Cost	Markups	Total Cost
Design	$3,227,083	$0	$3,227,083
Remedial Action	$26,900,364	$17,211,409	$44,111,773
Operations & Maintenance	$23,965,833	$18,954,272	$42,920,105
Site Closeout	$2,708,078	$2,026,762	$4,734,840
Total Site Cost	$56,801,357	$38,192,443	$94,993,800

EXHIBIT 6

Site Cost Summary Report (with Markups)

System:

RACER Version: RACER® Version 11.3.18.0
Database Location: C:\Users\hhhoratio\Documents\RACER 11.3\RACER.mdb

Folder:

Folder Name: Meyner & Landis

Project:

ID: AM115
Name: Chemours Chambers Works Manufacturing Facility
Category: None

Location
State / Country: NEW JERSEY
City: NEW JERSEY STATE AVERAGE

Location Modifier	Default	User	Reason for changes
	1.210	1.210	

Options
Database: Modified System Costs
Cost Database Date: 2016
Report Option: Fiscal

Description Cost Estimate for Remediation Action

Site Cost Summary Report
(with Markups)

Site:

ID: AOC6
Name: Triangle/Dyes
Type: AOC

Media/Waste Type

Primary: Groundwater
Secondary: Soil

Contaminant

Primary: Volatile Organic Compounds (VOCs)
Secondary: Semi-Volatile Organic Compounds (SVOCs)

Phase Names

- **Pre-Study** ☐
- **Study** ☐
- **Design** ☑
- **Removal/Interim Action** ☑
- **Remedial Action** ☑
- **Operations & Maintenance** ☑
- **Long Term Monitoring** ☑
- **Site Closeout** ☑

Documentation

Description: AOC 6, the Triangle / Dyes Area, is the largest of the DuPont designated AOCs at the site and is located in the central portion of the Chambers Works manufacturing area includes the following individual subareas based on process history, chemical use and disposal practices, and potential contaminant nature and extent:

- Triangle Intermediates
  Engineering QC Laboratory and Offices
  Basic Colors and Sulfur Colors Areas
- Sulfuric Acid Plant
  Former Indigo Heavy Chemicals Area
  Naphthalene Intermediate Area
  Azo Colors Area
  Ponsol Colors Number 1 Area and Ponsol Colors #2 Building

The majority of dye and intermediate compound production occurred in the Dyes Area from 1917 to 1980. Hundreds of different brand name dyes and innumerable different intermediary compounds were produced. In addition to producing products for market, research and development at the Jackson Labs, and other product-specific laboratories, the Dyes Area also contributed to the development of fluoroproducts, TEL, and elastomer products (e.g., "Neoprene" and "Viton"), among others. The basic chemical building blocks for the dyes manufactured in this area were commonly of benzene, anthracene, naphthalene, toluene, and xylene derivation with intermediates of alpha-and beta naphthylamine, anthroquinone, benzidine, chlorobenzene, dinitrotoluene, and nitrobenzene. With the exception of the Sulfuric Acid Plant and the Naphthalene Intermediate area, there is a possibility that any given dye, intermediate

Site Cost Summary Report
(with Markups)

compound, or waste stream could have occurred within any process area of the Dyes Area. The Triangle Intermediates Area contained production buildings, tanks, and support areas used for the generation and/or purification of various intermediate compounds used in the creation of dyes, as well as polymer products. Most of the buildings were constructed sometime during the period 1915 though the 1940s. Processes include the production of the following compounds: chloroanilines, dimethylaniline, nitroanilines, nitrobenzenes, toluidines, and nitrotoluenes. These chemicals were used for the production of various pharmaceuticals, agricultural chemicals, fibers, photographic chemicals, and other intermediates. Most of the production has been removed from the Triangle Intermediates area. Only the DMA Autoclave building, Zeppel intermediates, and Dinitrotoluene production remain in this area. In addition, several shops and store houses also remain. The remaining buildings have been dismantled, and only the concrete foundations remain. The Engineering QC Laboratory and Administration area is a small area located within the center of the AOC. No chemical production activities were undertaken in this area although several laboratories, garages, and a gas station historically have been present in this area. Currently, there are several active operations within AOC 6. Buildings and processes within the Dyes Area have been progressively dismantled since 1980, when DuPont ended dye manufacturing. The only operating process buildings within the Azo Colors Area are located in the Ethylene Oxide area. The remaining buildings are used for storage, maintenance, change houses, or administrative offices. Building 185 operations along with several shops and store houses remain active (1402, 656, 145, and 1114). Building 115, the Ethylene Oxide center, is also located within the former Naphthaline Intermediate Area. Ethylene Oxide (EO) is purchased by DuPont from an off-site vendor and used in this area to conduct ethyloxylations. This process is used to purify chemical intermediates in support of the Performance Chemicals manufacturing. Wastewater generated during this process is pumped to the on-site WWTP. A former laboratory building, 667, south of the EO center is actively being used for office space The operating buildings associated with the indigo dye production were removed prior to 1974 with the exception of Building 1113, 1035, 603/604, 1193, 1197 and 1370, which are currently used as office/storage space for operations at Zepel Intermediates. Most of the production has been removed from the Triangle Intermediates area. The DMA Autoclave building, Zepel Intermediates buildings (1486, 234, 1156, 120, 1476, and 652), and Dinitrotoluene production (1140, 1146, 121, 669, 1278, and 716) buildings remain in this area along with several shops and store houses. The other buildings have been dismantled, and only the concrete foundations and gravel areas remain. Hard surface consisting of gravel, concrete or asphalt covers the entire area where buildings are not present. AOC 6 contains, in whole or in part, several individual SWMUs. The SWMUs and their descriptions are: 9 Solvent Recovery Unit 1, 10 Solvent recovery Unit II, Portions of SWMU 17/17A Process Water Ditch System (A Ditch), 38 Clean Water Injection Wells, 41-3 Drum Storage, Area 3, 41-6 Drum Storage Area 6, 41-7 Drum Storage Area 7, 41-8 Drum Storage Area 8, Portions of SWMU 56A Historical Process Water Ditch System (B Ditch), 62 Aramids/Nitrators Sump, 63 Azo-Dye Area. Remedial actions were completed at SWMUs 17 and 56A. Additionally, in 2008, a 900-foot long sheet-pile barrier was installed on the northern side of the Salem Canal to prevent groundwater discharge (associated with AOC 6) from the B aquifer to the Salem Canal sediment and surface water. An approximate 300-foot extension for bank stabilization and erosion control was installed to the Munson Dam in 2012.

Soil Contamination: Soil data collected within the extent of AOC 6 indicate

Site Cost Summary Report (with Markups)

exceedances of NJNRDCSRS for VOCs, SVOCs, metals, and Total PCBs including VOCs (127 locations), SVOCs (103 locations), Metals (82 locations), Pesticides/Total PCBs (62 locations), with specific contaminant exceedances including: 1,2-Dichloroethane, 1,4-Dichlorobenzene, Benzene, Chlorobenzene, Chloroform, Tetrachloroethene, Trichloroethene, 1,2-Diphenylhydrazine, 2,4-Dinitrotoluene, 2,6-Dinitrotoluene, Benzidine, Benzo (a)anthracene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo[a]pyrene, Dibenz(a,h) Anthracene, Hexachlorobenzene, Indeno(1,2,3-cd)pyrene, Naphthalene, Arsenic, Cadmium, Lead, Total PCBs.

Groundwater Contamination: Groundwater in AOC 6 contains constituents above NJGWIIA with the B aquifer having the highest concentrations. In general, concentrations decrease with depth in the lower aquifers. Constituents that exceeded the screening criteria with the greatest margin of exceedance at each sampling location within AOC 6 are listedbelow per the 2014 Fact Sheet Although there are contaminants that exceed the screening criteria at each location,

B Aquifer: VOCs (63 locations), SVOCs (46 locations), Metals (39 locations), Pesticides/Total PCBs (17 locations), PFOA/PFOS (12 locations), with specific contaminant exceedances including: Benzene, Carbon Tetrachloride, Chlorobenzene, Tetrachloroethene, Trichloroethene, Vinyl Chloride, 1,2-Dibromoethane(EDB), 1,2-Dichloroethane, Other VOCs, Aniline, Benzo(a) anthracene, Nitrobenzene, 1,2,4-Trichlorobenzene, 2-Naphthylamine, 2,4-Dinitrotoluene, 4-Chloroaniline, Other SVOCs, Aluminum, Beryllium, Lead, Mercury, Other metals, Total PCBs, PFOA/PFOS.

C Aquifer: VOCs (9 locations), SVOCs (9 locations) Metals (9 locations), PFOA/PFOS (3 locations) with specific contaminants including: VOCs: Benzene, Chlorobenzene, Tetrachloroethene, SVOCs: Aniline, Hexachlorobenzene, Nitrobenzene, 1,2,4-Trichlorobenzene, 2,4-Dinitrotoluene, 4-Chloroaniline, Metals: Other metals, and PFOA/PFOS.

D Aquifer: VOCs (6 locations), SVOCs (6 locations), Metals (6 locations), with specific contaminant exceedances including: VOCs: Benzene, SVOCs: Aniline, 4-Chloroaniline, Other SVOCs, Metals: Lead, Other metals.

E Aquifer: From 1 sampling location, no exceedances except Other metals.

DNAPL: In AOC 6, probable and potential DNAPL source zones were identified for the B aquifer, and two relatively small potential DNAPL source zones were identified for the C aquifer. Analyses of six DNAPL samples collected at locations within AOC 6 indicate that the highest mass fraction of the samples consisted of chlorinated benzenes, nitroaromatics, and PAHs. D & E Aquifer DNAPL characterization has not yet been done. B-Aquifer impact at 20 ft thickness x AOC acreage per reports and Figures 7-27, 28, 40, among others.

Soil Vapor: Sub-slab soil gas samples were collected from Buildings 603, 604 and 667 within AOC 6 during the most recent 2014 VI Investigation. Eleven soil gas samples were collected during the investigation. Chloroform, tetrachloroethene and trichloroethene were detected in soil gas samples from Buildings 603 and 667 above NJNRSGSLs. Multiple VOCs (1,2-dichloroethane, 1,4-dichlorobenzene, benzene, bromodichloromethane, chlorobenzene, chloroform and ethylbenzene) were detected in soil gas samples from Building

Site Cost Summary Report
(with Markups)

604.

Long-term Monitoring: Groundwater monitoring is performed under several programs at Chambers Works. Monitoring wells within the AOC 6 boundary include those to support the Perimeter Monitoring Program and PFOA Monitoring Program.

Support Team: The TBLS Group

References:
CRG. 2007. Site Investigation Report Addendum for Perfluorooctanoic Acid. DuPont Chambers Works, Deepwater, New Jersey.
CRG. 2006. Preliminary Assessment Report. DuPont Chambers Works Complex, Deepwater, New Jersey.
CRG. 2006. Site Investigation Report for Perfluorooctanoic Acid. DuPont Chambers Works, Deepwater, New Jersey.
Geosyntec Consultants, Inc. 2012. Perimeter Area (AOCs 1, 2, & 3) Remedial Action Selection Report (RASR). DuPont Chambers Works, Deepwater, New Jersey.
URS. 2014. Comprehensive RCRA Facility Investigation Report. DuPont Chambers Works Complex, Deepwater, New Jersey.
URS. 2014. Vapor Intrusion Remedial Investigation Work Plan, DuPont Chambers Works, Deepwater, New Jersey.
URS. 2013. RCRA Facility Investigation Data Gap Sampling Plan. DuPont Chambers Works, Deepwater, New Jersey.
URS. 2013. Interior Investigation Technical Memorandum. DuPont Chambers Works, Deepwater, New Jersey.
URS. 2011. Perfluorooctanoic Acid Groundwater Investigation Report Addendum II. DuPont Chambers Works, Deepwater, New Jersey.
URS. 2010. Perimeter Investigation Report. DuPont Chambers Works Site, Deepwater, New Jersey. August 2010.

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Site Cost Summary Report
(with Markups)

Phase	Direct Cost	Markups	Total Cost
Design	$4,955,698	$0	$4,955,698
Remedial Action	$41,965,460	$24,712,805	$66,678,265
Operations & Maintenance	$24,160,312	$19,004,874	$43,165,186
Site Closeout	$537,167	$680,454	$1,217,621
Total Site Cost	$71,618,637	$44,398,133	$116,016,770

EXHIBIT 7

Site Cost Summary Report (with Markups)

System:

RACER Version: RACER® Version 11.3.18.0
Database Location: C:\Users\hhhoratio\Documents\RACER 11.3\RACER.mdb

Folder:

Folder Name: Meyner & Landis

Project:

ID: AM115
Name: Chemours Chambers Works Manufacturing Facility
Category: None

Location
State / Country: NEW JERSEY
City: NEW JERSEY STATE AVERAGE

Location Modifier	Default	User	Reason for changes
	1.210	1.210	

Options
Database: Modified System Costs
Cost Database Date: 2016
Report Option: Fiscal

Description Cost Estimate for Remediation Action

Site Cost Summary Report
(with Markups)

Site:

ID: AOC 7
Name: Elastomers
Type: AOC

Media/Waste Type

Primary: Soil
Secondary: Groundwater

Contaminant

Primary: Semi-Volatile Organic Compounds (SVOCs)
Secondary: Volatile Organic Compounds (VOCs)

Phase Names

Pre-Study ☐
Study ☐
Design ☑
Removal/Interim Action ☑
Remedial Action ☑
Operations & Maintenance ☑
Long Term Monitoring ☑
Site Closeout ☑

Documentation

Description: AOC 7, the Elastomers Area, is located in the central portion of the Chambers Works manufacturing area and is 18.4 acres. Period of Use: Neoprene Early 1920s – 1949, Hylene 1949 - 1980, Adiprene 1950s – 1960s, Viton 1959 – to date. In general, there were five major businesses (Neoprene, Viton, Adiprene, Hylene and Hytrel) consisting of over 100 products that were highly specialized and unique to the rubber industry at the site. Currently, the AOC 7 area consists of existing production Building 756, 745 and 1076 and office buildings. Hard surface consisting of gravel, concrete or asphalt covers the entire area where buildings are not present.

AOC 7 contains in part three SWMUs, including: Portions of SWMU 17/17A Process Water Ditch System (A Ditch), Portions of SWMU 30 Sanitary landfills A and B, Portions of SWMU 56 ODCB Area, Portions of SWMU 56A Historical Process Water Ditch System (B Ditch).

Soil Contamination: Soil data collected within the extent of AOC 7 indicate exceedances of NJNRDCSRS for VOCs, SVOCs, metals and Total PCBs. There were no pesticide, PFOA or PFOS exceedances. Constituents that exceeded the NJNRDCSRS
within AOC 7 include the following: 1,2-Dicholorobenzene, 1,4-Dichlorobenzene, Benzene, Chlorobenzene, Trichloroethene, 1,2 -Diphenylhydrazine, 2,4-Dinitrotoluene, 2,6-Dinitrotoluene, Benzo(a)anthracene, Benzo(b)fluoranthene, Benzo[a]pyrene, Dibenz (a,h)anthracene, Naphthalene, Arsenic, Lead, Total PCBs.

Groundwater Contamination: Groundwater in AOC 7 contains constituents

Site Cost Summary Report
(with Markups)

above NJGWIIA with the B aquifer having the highest concentrations.

B Aquifer: VOCs (10 locations), SVOCs (11 locations), Metals (8 locations), Pesticides/Total PCBs (16 locations), PFOA/PFOS (5 locations) with specific contaminants including: VOC: Benzene, Chlorobenzene, Trichloroethene, Other; SVOC: Aniline, Benzo (a)anthracene, Nitrobenzene, 4-Chloroaniline, Other SVOCs; Metals: Aluminum, Arsenic, Lead, Other metals; Total PCBs, Other PCBs; and PFOA.

C Aquifer: VOCs (2 locations) Benzene, SVOCs (2 locations) 4-Chloroaniline, Metals (2 locations) Other metals.

D Aquifer: VOCs (1 location) Benzene; SVOCs (1 location) 4-Chloroaniline; Metals (1 location) Other metals.

E Aquifer not sampled in 2014 RFI.

DNAPL/NAPL: Evaluation of the exceedances and probable and potential DNAPL source zones in the B aquifer indicate that B aquifer groundwater is impacted beneath the entire AOC 7 area. The current IWS likely creates more co-mingling of plumes from
multiple source areas toward IWS pumping wells located in the site interior. Residual DNAPL, as well as DNAPL diffused into finer-grained units, will likely continue to impact B aquifer groundwater. B-Aquifer impact at 20 ft thickness x AOC acreage per reports and Figures 7-27, 28, 40, among others.

Vapor Intrusion: No sub-slab soil gas samples were collected from within AOC 7 during the most recent2014 VI Investigation. No indoor air IH sampling was conducted within AOC 7 duringthe March/April 2012. However correspondence indicates all buildings will be sampled on a schedule of 60/year.

Monitoring: Currently, there are three locations within the AOC 7 boundary that are included in the NAPL program. Monitoring wells within the AOC 7 boundary include those to support the PFOA Monitoring Program.

Support Team: The TBLS Group, LLC.

References:

CRG. 2007. Site Investigation Report Addendum for Perfluorooctanoic Acid. DuPont Chambers Works, Deepwater, New Jersey.
CRG. 2006. Preliminary Assessment Report. DuPont Chambers Works Complex, Deepwater, New Jersey.
CRG. 2006. Site Investigation Report for Perfluorooctanoic Acid. DuPont Chambers Works, Deepwater, New Jersey.
Geosyntec Consultants, Inc. 2012. Perimeter Area (AOCs 1, 2, & 3) Remedial Action Selection Report (RASR). DuPont Chambers Works, Deepwater, New Jersey.
URS. 2014. Comprehensive RCRA Facility Investigation Report. DuPont Chambers Works Complex, Deepwater, New Jersey.
URS. 2014. Vapor Intrusion Remedial Investigation Work Plan, DuPont Chambers Works, Deepwater, New Jersey.
URS. 2013. RCRA Facility Investigation Data Gap Sampling Plan. DuPont Chambers Works, Deepwater, New Jersey.
URS. 2013. Interior Investigation Technical Memorandum. DuPont Chambers Works, Deepwater, New Jersey.
URS. 2011. Perfluorooctanoic Acid Groundwater Investigation Report Addendum II. DuPont Chambers Works, Deepwater, New Jersey.

Site Cost Summary Report
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URS. 2010. Perimeter Investigation Report. DuPont Chambers Works Site, Deepwater, New Jersey. August 2010.

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Estimator Signature: _____ **Date:** 2 Dec 2016

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Date Reviewed: 12/01/2016
Reviewer Signature: Paul Scian **Date:** 2 Dec 2016

Site Cost Summary Report
(with Markups)

Phase	Direct Cost	Markups	Total Cost
Design	$2,097,106	$0	$2,097,106
Remedial Action	$18,910,003	$12,734,954	$31,644,956
Operations & Maintenance	$17,291,711	$13,290,651	$30,582,362
Site Closeout	$650,494	$757,291	$1,407,785
Total Site Cost	$38,949,314	$26,782,895	$65,732,209

EXHIBIT 8

Site Cost Summary Report (with Markups)

System:

RACER Version: RACER® Version 11.3.18.0
Database Location: C:\Users\hhhoratio\Documents\RACER 11.3\RACER.mdb

Folder:

Folder Name: Meyner & Landis

Project:

ID: AM115
Name: Chemours Chambers Works Manufacturing Facility
Category: None

Location
State / Country: NEW JERSEY
City: NEW JERSEY STATE AVERAGE

Location Modifier	Default	User	Reason for changes
	1.210	1.210	

Options
Database: Modified System Costs
Cost Database Date: 2016
Report Option: Fiscal

Description Cost Estimate for Remediation Action

Site Cost Summary Report
(with Markups)

Site:

ID: AOC8
Name: Warehouse/Transport/Construction
Type: AOC

Media/Waste Type

Primary: Groundwater
Secondary: Soil

Contaminant

Primary: Volatile Organic Compounds (VOCs)
Secondary: Semi-Volatile Organic Compounds (SVOCs)

Phase Names

- **Pre-Study** ☐
- **Study** ☐
- **Design** ☑
- **Removal/Interim Action** ☑
- **Remedial Action** ☑
- **Operations & Maintenance** ☑
- **Long Term Monitoring** ☑
- **Site Closeout** ☑

Documentation

Description: AOC 8, the Warehouse, Transport and Construction Area, is 18.8 acres which operated from 1939 to present and is located in the central portion of the Chambers Works manufacturing area and consists of two subareas - the former warehouse and storage areas in the western portion and the construction area in the eastern portion of the AOC. The Warehouse and Transport area was historically used for the storage and shipping of intermediate compounds, finished products, and drums. The primary marshalling yard for broad gauge railroad traffic is also located in this area. This switch yard still exists today. The plant narrow gauge railroad is also present in this area feeding into the store buildings. This railroad is operated and maintained by the site for the hauling of materials around the plant site. The Construction Area has historically been used for the fabrication of machinery, reactors, and buildings. These products were used at the site and were also shipped to other plant sites around the world. No chemical manufacturing processes were undertaken at this area. Currently, the Building 833 warehouse is being used by plant operations. All other buildings have been removed down to their foundations. Railroad spur lines are present and hard surface consisting of gravel, concrete or asphalt covers the entire area where buildings are not present. AOC 8 contains, in whole or in part, two SWMUs: 11 Storage Tank; and Portions of SWMU 17/17A Process Water Ditch System (A Ditch).

Soil Contamination: Soil data collected within the extent of AOC 8 indicate exceedances of NJNRDCSRS for VOCs, SVOCs and metals. Constituents that exceeded the NJNRDCSRS within AOC 8 include the following. VOCs (10 locations) 1,4-Dichlorobenzene; SVOCs (10 locations) Benzo[a]pyrene; Metals (11 locations) Lead.

Site Cost Summary Report (with Markups)

Groundwater Contamination:Groundwater in AOC 8 contains constituents above NJGWIIA with the B aquifer having the highest concentrations. In general, concentrations decrease with depth in the lower aquifers.

B Aquifer: VOCs (6 locations) Benzene, Chlorobenzene, Trichloroethene, Vinyl Chloride. SVOCs (6 locations) Aniline, Benzo(a) Anthracene, Nitrobenzene, 1,2,4-Trichlorobenzene, 4-Chloroaniline , Metals (6 locations) Aluminum, Other metals; Pesticides/Total PCBs (6 locations) Total PCBs, Other PCBS, Pesticides, PFOA/PFOS (1 location) Not Analyzed.

C Aquifer: VOCs (1 location) Tetrachloroethene, SVOCs (1 location) 4-Chloroaniline, Metals (1 location) Other metals. Not analyzed for PCBs or PFOAs.

D Aquifer: VOCs (1 location) Benzene; SVOCs (1 locations) 1,2,4-Trichlorobenzene; Metals (1 location) Other metals; Not Analyzed for Pesticides, PCBs or PFOAs/PFOS,

The E Aquifer was not sampled in the latest RFI in AOC 8.

DNAPL/NAPL: Evaluation of the exceedances and probable and potential DNAPL source zones in the B aquifer indicate that B aquifer groundwater is impacted beneath the entire AOC 8 area. However, groundwater plumes are co-mingled, heterogeneous, and extend beyond the AOC 8 boundaries. Potential releases (especially from waste ditches) were not limited by AOC boundaries, and the current IWS likely creates more co-mingling of plumes from multiple source areas toward IWS pumping wells located in the site interior. Residual DNAPL, as well as DNAPL diffused into finer-grained units, will likely continue to impact B aquifer groundwater. Impacts to the C aquifer are far less in terms of the magnitude of groundwater concentrations and the margins of exceedances. In general, the D aquifer is less impacted than the C aquifer. B-Aquifer impact at 20 ft thickness x AOC acreage per reports and Figures 7-27, 28, 40, among others.

Vapor Intrusion: No sub-slab soil gas samples were collected from within AOC 8 during the most recent 2014 VI Investigation. No indoor air IH sampling was conducted within AOC 8 during the March/April 2012. Chemours is conducting VI on 60 bldgs per year.

Monitoring:

Support Team: The TBLS Group, LLC.

References:

CRG. 2007. Site Investigation Report Addendum for Perfluorooctanoic Acid. DuPont Chambers Works, Deepwater, New Jersey.
CRG. 2006. Preliminary Assessment Report. DuPont Chambers Works Complex, Deepwater, New Jersey.
CRG. 2006. Site Investigation Report for Perfluorooctanoic Acid. DuPont Chambers Works, Deepwater, New Jersey.
Geosyntec Consultants, Inc. 2012. Perimeter Area (AOCs 1, 2, & 3) Remedial Action Selection Report (RASR). DuPont Chambers Works, Deepwater, New Jersey.
URS. 2014. Comprehensive RCRA Facility Investigation Report. DuPont Chambers Works Complex, Deepwater, New Jersey.
URS. 2014. Vapor Intrusion Remedial Investigation Work Plan, DuPont

Site Cost Summary Report
(with Markups)

Chambers Works, Deepwater, New Jersey.
URS. 2013. RCRA Facility Investigation Data Gap Sampling Plan. DuPont Chambers Works, Deepwater, New Jersey.
URS. 2013. Interior Investigation Technical Memorandum. DuPont Chambers Works, Deepwater, New Jersey.
URS. 2011. Perfluorooctanoic Acid Groundwater Investigation Report Addendum II. DuPont Chambers Works, Deepwater, New Jersey.
URS. 2010. Perimeter Investigation Report. DuPont Chambers Works Site, Deepwater, New Jersey. August 2010.

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Estimate Prepared Date: 12/01/2016
Estimator Signature: _____ **Date:** 2 Dec 2016

Reviewer Information

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Email Address: pauls@thetblsgroup.com
Date Reviewed: 12/01/2016
Reviewer Signature: _____ **Date:** 2 Dec 2016

Site Cost Summary Report (with Markups)

Phase	Direct Cost	Markups	Total Cost
Design	$2,211,213	$0	$2,211,213
Remedial Action	$19,858,854	$13,234,410	$33,093,264
Operations & Maintenance	$19,072,541	$14,343,852	$33,416,393
Site Closeout	$443,053	$634,257	$1,077,310
Total Site Cost	$41,585,660	$28,212,519	$69,798,179

EXHIBIT 9

Site Cost Summary Report (with Markups)

System:

RACER Version: RACER® Version 11.3.18.0
Database Location: C:\Users\hhhoratio\Documents\RACER 11.3\RACER.mdb

Folder:

Folder Name: Meyner & Landis

Project:

ID: AM115
Name: Chemours Chambers Works Manufacturing Facility
Category: None

Location

State / Country: NEW JERSEY
City: NEW JERSEY STATE AVERAGE

Location Modifier	Default	User	Reason for changes
	1.210	1.210	

Options

Database: Modified System Costs
Cost Database Date: 2016
Report Option: Fiscal

Description Cost Estimate for Remediation Action

Site Cost Summary Report
(with Markups)

Site:

ID: AOC9
Name: Monastral
Type: AOC

Media/Waste Type

Primary: Soil
Secondary: Groundwater

Contaminant

Primary: Semi-Volatile Organic Compounds (SVOCs)
Secondary: Volatile Organic Compounds (VOCs)

Phase Names

- **Pre-Study** ☐
- **Study** ☐
- **Design** ☑
- **Removal/Interim Action** ☑
- **Remedial Action** ☑
- **Operations & Maintenance** ☑
- **Long Term Monitoring** ☑
- **Site Closeout** ☑

Documentation

Description: AOC 9, the Monastral Area, is 35.2 acres located in the southeastern section of the Chambers Works manufacturing area (see Figure A-1). AOC 9 includes the Manhatten Project-related buildings, the Consolidated Warehouse Building, and the Monastral Area related buildings. Manhatten Project is contained under the AOC known as FUSRAP and is the responsibility of the Army Corp of Engineers.

One of the former East Area buildings was used as a warehouse by the Ponsol Area to store crude colors and intermediates. Two other buildings were extensively remodeled for the Petroleum Laboratory facilities. In 1952, the East Area Warehouse Building was converted into a dryhouse facility. The Consolidated Warehouse Building was constructed in the mid-1950s and was used for shipping and receiving. Various finished products were stored here until shipped. In addition, raw materials were stored when received until they were dispersed to other plant locations. This warehouse still serves as the warehouse for the site. Products and materials were shipped and received via a railroad track that was located on the southern side of the warehouse. Process records indicate that Buildings 886 and 1149 were used for Monastral production from 1978 to 1995. In 1985, Building 886 was used to produce dimethyl-5-sulfo-isophthalide (DRL-6), a finishing agent used to aid in the dye receptivity of Dacron® fiber. The process involved reacting isophthalic acid with sulfur trioxide and then with methanol. In 1986, Building 886 was used to produce N-5297 (Omethoxycarbonyl benzyl sulfonamide) using o-methylbenzoic acid reacted in several steps with methyl alcohol, chlorine, sodium thiosulfate, and ammonia in ODCB to form the sulfonamide. This intermediate (N-5297) was used to produce a rice herbicide. Waste streams either were incinerated or were discharged to the ditches (SWMU 17) and treated at the WWTP. A railroad spur is located to

Site Cost Summary Report
(with Markups)

the south of these buildings and may have been used for loading and unloading of process chemicals. Currently, the AOC 9 consists of the consolidated warehouse, the Medical building and Garage, and miscellaneous drum and trailer storage areas. No operational process areas are currently located within this AOC. The hard surface consisting of gravel, concrete or asphalt covers the entire area where buildings are not present.

AOC 9 contains, in whole or in part, several individual SWMUs. The SWMUs include Portions of SWMU 17/17A Process Water Ditch System (A Ditch), Portions of SWMU 33 Manhattan Project Areas, 39-1 UST-1, 41-1 Drum Storage Area 1, 41-2 Drum Storage Area 2, 41-4 Drum Storage Area 4, Portions of SWMU 55-5 Chambers Works Area of Fill Deposition 5, Portions of SWMU 56A Historical Process Water Ditch System (B Ditch).

Soil Contamination; Soil data collected within the extent of AOC 9 indicate exceedances of NJNRDCSRS for SVOCs. PCBSs/Pesticides, VOCs, and Metals were not elevated in 2014 investigations but were elevated in the 2010 Perimeter Investigation. PVOA/PVOS were not analyzed. Soil contaminants that were elevated include Benzo(a)anthracene, Benzo(b) fluoranthene, Benzo[a]pyrene, Dibenz(a,h)anthracene.

Groundwater Contamination: Groundwater in AOC 9 contains constituents above NJGWIIA with the B aquifer having the highest concentrations. In general, concentrations decrease with depth in the lower aquifers.

B-Aquifer: VOCs (19 locations) Benzene, Carbon Tetrachloride, Chlorobenzene, Other VOCs; SVOCs (23 locations) Nitrobenzene, 1,2,4-Trichlorobenzene, 4-Chloroaniline, Other SVOCs; Metals (21 locations) Aluminum, Lead, Other metals; Pesticides/Total PCBs (4 locations) Total PCBs; PFOA/PFOS (1 location) Not analyzed.

C-Aquifer: VOCs (1 location) Other VOC; SVOCs (1 location) No Detections, Metals (1 location) Other metals.

D-Aquifer: VOCs (2 locations) Benzene; SVOC (2 locations) 1,2,4-Trichlorobenzene; Metals (2 locations) Other metals; Pesticides/Total PCBs (0 locations) ; PFOA/PFOS (1 location) No Exceedances/No Detection.

E Aquifer: VOCs (1 location) Benzene; SVOCs (1 location) Analine; Metals (1 location) Other metals; Pesticides/Total PCBs (0 locations); PFOA/PFOS (1 location) Not Analyzed

DNAPL/NAPL: In AOC 9, probable and potential DNAPL source zones were identified for the B aquifer. Analyses of one DNAPL sample collected at locations within AOC 9 indicate that the highest mass fraction of the sample consisted chlorinated benzenes and nitroaromatics. Evaluation of the exceedances and probable and potential DNAPL source zones in the B aquifer indicate that B aquifer groundwater is impacted beneath the entire AOC 9 area based on Figures provided. The current IWS likely creates more co-mingling of plumes from multiple source areas toward IWS pumping wells located in the site interior. Residual DNAPL, as well as DNAPL diffused into finer-grained units, will likely continue to impact B aquifer groundwater. B-Aquifer impact at 20 ft thickness x AOC acreage per reports and Figures 7-27, 28, 40, among others.However, groundwater plumes are co-mingled, heterogeneous, and

Site Cost Summary Report
(with Markups)

extend beyond the AOC 9 boundaries. Potential releases (especially from waste ditches) were not limited by AOC boundaries, and the current IWS likely creates more comingling of plumes from multiple source areas toward IWS pumping wells located in the site interior. Residual DNAPL, as well as DNAPL diffused into finer-grained units, will likely continue to impact B aquifer groundwater. Impacts to the C aquifer are far less in terms of the magnitude of groundwater concentrations and the margins of exceedances and are also limited to the northwestern half of the AOC. In general, the D aquifer is less impacted than the C aquifer.

Vapor Intrusion: Sub-slab soil gas samples were collected from Building 1420 within AOC 9 during the most recent 2014 VI Investigation. Three soil gas samples were collected during the investigation. No constituents were detected in the soil gas samples above NJNRSGSLs. However, more widespread sampling is to take place in 2016, 2017, and 2018 as captured in AOC 20.

Long-term Monitoring: Monitoring wells within the AOC 9 boundary include those to support the PFOA Monitoring Program.

Support Team: The TBLS Group, LLC

References:
CRG. 2007. Site Investigation Report Addendum for Perfluorooctanoic Acid. DuPont Chambers Works, Deepwater, New Jersey.
CRG. 2006. Preliminary Assessment Report. DuPont Chambers Works Complex, Deepwater, New Jersey.
CRG. 2006. Site Investigation Report for Perfluorooctanoic Acid. DuPont Chambers Works, Deepwater, New Jersey.
URS. 2014. Comprehensive RCRA Facility Investigation Report. DuPont Chambers Works Complex, Deepwater, New Jersey.
URS. 2014. Vapor Intrusion Remedial Investigation Work Plan, DuPont Chambers Works, Deepwater, New Jersey.
URS. 2013. RCRA Facility Investigation Data Gap Sampling Plan. DuPont Chambers Works, Deepwater, New Jersey.
URS. 2013. Interior Investigation Technical Memorandum. DuPont Chambers Works, Deepwater, New Jersey.
URS. 2011. Perfluorooctanoic Acid Groundwater Investigation Report Addendum II. DuPont Chambers Works, Deepwater, New Jersey.
URS. 2010. Perimeter Investigation Report. DuPont Chambers Works Site, Deepwater, New Jersey. August 2010.
URS, 2014 AOC 9 Fact Sheet.
Second Semester 2015 NPDES/DGW Report, 2016, AECOM

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Estimate Prepared Date: 12/04/2016

Estimator Signature: _____ **Date:** 12/4/2016

Reviewer Information

Site Cost Summary Report
(with Markups)

Phase	Direct Cost	Markups	Total Cost
Design	$3,492,814	$0	$3,492,814
Remedial Action	$28,146,555	$17,911,601	$46,058,156
Operations & Maintenance	$26,950,384	$20,826,457	$47,776,841
Site Closeout	$729,818	$792,156	$1,521,974
Total Site Cost	$59,319,570	$39,530,214	$98,849,785

EXHIBIT 10

Site Cost Summary Report (with Markups)

System:

RACER Version: RACER® Version 11.3.18.0
Database Location: C:\Users\hhhoratio\Documents\RACER 11.3\RACER.mdb

Folder:

Folder Name: Meyner & Landis

Project:

ID: AM115
Name: Chemours Chambers Works Manufacturing Facility
Category: None

Location
State / Country: NEW JERSEY
City: NEW JERSEY STATE AVERAGE

Location Modifier	Default	User	Reason for changes
	1.210	1.210	

Options
Database: Modified System Costs
Cost Database Date: 2016
Report Option: Fiscal

Description Cost Estimate for Remediation Action

Site Cost Summary Report (with Markups)

Site:

ID: AOC10
Name: White Products
Type: AOC

Media/Waste Type

Primary: Groundwater
Secondary: Soil

Contaminant

Primary: Volatile Organic Compounds (VOCs)
Secondary: Semi-Volatile Organic Compounds (SVOCs)

Phase Names

- **Pre-Study** ☐
- **Study** ☐
- **Design** ☑
- **Removal/Interim Action** ☑
- **Remedial Action** ☑
- **Operations & Maintenance** ☑
- **Long Term Monitoring** ☑
- **Site Closeout** ☑

Documentation

Description: AOC 10, White Products, is a 1.5 Acre site located along the southern boundary of the Chambers Works manufacturing area along the Salem Canal (see Figure A-1). The White Products area was used to produce synthetic camphor beginning in 1917 and continued through 1959. The compounds used in the production of camphor included the following: acetone, sulfuric acid, caustic soda (sodium hydroxide), chlorine, hydrochloric acid, sulfur dioxide, sperm oil, peanut oil, cocoa nut oil, anhydrous isopropanol, and bulk ammonia. Starting in 1932, the White Products area made a variety of compounds, including detergents, textile finishing agents, water repellents, rubber chemicals, and petroleum chemicals. White Products stopped manufacture and was fully decommissioned by 2012. This area was also used as the North Bulk Storage area, which includes the former loading and unloading areas to the north of Buildings 149, 152, and 788. Based on disposal practices ascertained from the Dyes Area, it can be assumed that any wastewater produced was most likely released to the closest ditch system. Process wastewater from buildings adjacent to the Salem Canal may have discharged directly to the canal prior to 1932, at which time the canal became the primary freshwater water supply for the plant. Currently, there are no active operating areas within White Products. There are no occupied buildings within AOC 10. Building structures are still present within the AOC and most of the area is covered with gravel.

AOC 10 includes portions of SWMU 17/17A, the Process Water Ditch System (A Ditch).

Soil Contamination: Soil data collected within the extent of AOC 10 indicate exceedances of NJNRDCSRS for SVOCs as of 2014 including benzo(a)pyrene.

Site Cost Summary Report (with Markups)

Groundwater contamination: Groundwater samples were collected at several locations (see the table below) from the B and C aquifers, respectively within the AOC 10 boundary. No groundwater samples were collected from the D or E aquifers as part of these investigations. Groundwater in AOC 10 contains constituents above NJGWIIA with the B aquifer having the highest concentrations. In general, concentrations decrease with depth in the lower aquifers. Groundwater contaminant exceedances include: B-Aquifer: VOCs (1 location sampled) Trichloroethene, Metals (1 location sampled) Other metals. C Aquifer: Metals (1 location) Other metals.

NAPL/DNAPL: Evaluation of the exceedances and potential DNAPL source zones in the B aquifer indicate that B aquifer groundwater is impacted beneath the entire AOC 10 area. Impacts to the D aquifer are less than in the B aquifer. Currently, there are no locations within the AOC 10 boundary that are included in the NAPL/DNAPL program.

Vapor Intrusion: No sub-slab soil gas samples were collected from within AOC 10 during the most recent 2014 VI Investigation. No indoor air IH sampling was conducted within AOC 10 during the March/April 2012.

Groundwater Monitoring: Monitoring wells within the AOC 10 boundary include those to support the Perimeter Monitoring Program and PFOA Monitoring Program.

Support Team: The TBLS Group

References:

CRG. 2007. Site Investigation Report Addendum for Perfluorooctanoic Acid. DuPont Chambers Works, Deepwater, New Jersey.
CRG. 2006. Preliminary Assessment Report. DuPont Chambers Works Complex, Deepwater, New Jersey.
CRG. 2006. Site Investigation Report for Perfluorooctanoic Acid. DuPont Chambers Works, Deepwater, New Jersey.
URS. 2014. Comprehensive RCRA Facility Investigation Report. DuPont Chambers Works Complex, Deepwater, New Jersey.
URS. 2014. Vapor Intrusion Remedial Investigation Work Plan, DuPont Chambers Works, Deepwater, New Jersey.
URS. 2013. RCRA Facility Investigation Data Gap Sampling Plan. DuPont Chambers Works, Deepwater, New Jersey.
URS. 2013. Interior Investigation Technical Memorandum. DuPont Chambers Works, Deepwater, New Jersey.
URS. 2011. Perfluorooctanoic Acid Groundwater Investigation Report Addendum II. DuPont Chambers Works, Deepwater, New Jersey.
URS. 2010. Perimeter Investigation Report. DuPont Chambers Works Site, Deepwater, New Jersey. August 2010.
URS, 2002, 2014 AOC 10 Fact Sheet.

Estimator Information

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Estimate Prepared Date: 12/01/2016

Site Cost Summary Report (with Markups)

Estimator Signature: _____ **Date:** 2 Dec 2016

Reviewer Information

Reviewer Name: Paul Scian
Reviewer Title: Principal Analyst/Hydrogeologist
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Business Address: 25 South Road
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Email Address: pauls@thetblsgroup.com
Date Reviewed: 12/01/2016

Reviewer Signature: _____ **Date:** 2 Dec 2016

Site Cost Summary Report
(with Markups)

Phase	Direct Cost	Markups	Total Cost
Design	$453,325	$0	$453,325
Remedial Action	$4,069,084	$4,338,254	$8,407,338
Operations & Maintenance	$1,805,581	$1,351,725	$3,157,307
Site Closeout	$436,016	$668,165	$1,104,181
Total Site Cost	$6,764,007	$6,358,144	$13,122,151

EXHIBIT 11

Site Cost Summary Report
(with Markups)

System:

RACER Version: RACER® Version 11.3.18.0
Database Location: C:\Users\hhhoratio\Documents\RACER 11.3\RACER.mdb

Folder:

Folder Name: Meyner & Landis

Project:

ID: AM115
Name: Chemours Chambers Works Manufacturing Facility
Category: None

Location
State / Country: NEW JERSEY
City: NEW JERSEY STATE AVERAGE

Location Modifier	Default	User	Reason for changes
	1.210	1.210	

Options
Database: Modified System Costs
Cost Database Date: 2016
Report Option: Fiscal

Description Cost Estimate for Remediation Action

Site Cost Summary Report
(with Markups)

Site:

ID: AOC11
Name: Basins & Drainage Ditch
Type: AOC

Media/Waste Type

Primary: Soil
Secondary: Groundwater

Contaminant

Primary: Semi-Volatile Organic Compounds (SVOCs)
Secondary: Volatile Organic Compounds (VOCs)

Phase Names

- **Pre-Study** ☐
- **Study** ☐
- **Design** ☑
- **Removal/Interim Action** ☑
- **Remedial Action** ☑
- **Operations & Maintenance** ☑
- **Long Term Monitoring** ☑
- **Site Closeout** ☑

Documentation

Description: AOC 11, covers an area of 5.5 acres, and consists of the former drainage ditch located along the Delaware River north of the Basins. AOC 11 includes two former drainage ditches and an outfall. The drainage ditch located along the river was used pre-
1940 through 1962, after which it was filled in. The second drainage area discharged to Henby Creek from pre-1940 until it was filled in by 1946. There were no manufacturing activities associated with AOC 11. Existing structures within AOC 11 include a perimeter security fence and River Road. The remaining area is a slope overgrown with grasses and the shoreline along the Delaware River. AOC 11 includes portions of SWMU 60, the Drum Disposal Area. The drums have been removed as part of the remedial action of SWMU 60.

Soil Contamination: Soil data collected within the extent of AOC 11 from past investigations indicated exceedances of NJNRDCSRS for SVOCs, VOCs and metals. Pesticides/total PCBs and PFOA and PFOS were not analyzed. Constituents that exceeded the NJNRDCSRS within AOC 11 include the following SVOCs: 2,4-Dinitrotoluene, Benzo(a)anthracene, Benzo(b) fluoranthene, Benzo[a]pyrene, Dibenz(a,h)anthracene, Indeno(1,2,3-cd)pyrene.

Groundwater: No groundwater samples were collected from the C, D, or E aquifers as part of these investigations. B aquifer groundwater in AOC 11 contains constituents above NJGWIA with the greatest exceedances included: VOCs (3 locations) Benzene, SVOCs (3 locations), Aniline, Benzo(a)anthracene, 4-Chloroaniline, Metals (3 locations) Aluminum, Arsenic, Other metals.

Site Cost Summary Report
(with Markups)

NAPL/DNAPL: Evaluation of the exceedances and probable and potential DNAPL source zones in the B aquifer indicate that B aquifer groundwater is impacted beneath the entire AOC 11 area and in addition appears to continue offsite to the north, south, east, and west. The current IWS likely creates more co-mingling of plumes from multiple source areas toward IWS pumping wells located in the site interior. Residual DNAPL, as well as DNAPL diffused into finer-grained units, will likely continue to impact B aquifer groundwater. B-Aquifer impact at 20 ft thickness x AOC acreage per reports and Figures 7-7 thru 7-27, 7-28, 7-40, among others of the November 2014 Comprehensive Facility Investigation by URS, as subsequently modified by regulator requests through 2016.

Groundwater monitoring: Monitoring wells within the AOC 11 boundary include those to support the Perimeter Monitoring Program.

Vapor Intrusion: Since there are no occupied buildings reported, vapor intrusion is not likely a significant issue for AOC-11.

Support Team: The TBLS Group, LLC

References: CRG. 2006. Preliminary Assessment Report. DuPont Chambers Works Complex, Deepwater, New Jersey.
URS. 2014. Comprehensive RCRA Facility Investigation Report. DuPont Chambers Works Complex, Deepwater, New Jersey.
URS 2011. Delaware River Remedial Investigation Report. DuPont Chambers Works, Deepwater, New Jersey.
URS. 2010. Perimeter Investigation Report. DuPont Chambers Works Site, Deepwater, New Jersey. August 2010.
URS, 2002, 2014 AOC 11 Fact Sheet.
Second Semester 2015 NPDES/DGW Report, 2016, AECOM

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Estimator Signature: [signature] **Date:** 12/5/2016

Reviewer Information

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Date Reviewed: 12/05/2016
Reviewer Signature: [signature] **Date:** 5 Dec 2016

Site Cost Summary Report
(with Markups)

Phase	Direct Cost	Markups	Total Cost
Design	$1,352,744	$0	$1,352,744
Remedial Action	$20,823,567	$12,972,713	$33,796,280
Operations & Maintenance	$8,775,119	$6,183,356	$14,958,475
Site Closeout	$9,715,361	$5,115,116	$14,830,477
Total Site Cost	$40,666,791	$24,271,185	$64,937,976

EXHIBIT 12

Site Cost Summary Report (with Markups)

System:

RACER Version: RACER® Version 11.3.18.0
Database Location: C:\Users\hhhoratio\Documents\RACER 11.3\RACER.mdb

Folder:

Folder Name: Meyner & Landis

Project:

ID: AM115
Name: Chemours Chambers Works Manufacturing Facility
Category: None

Location
State / Country: NEW JERSEY
City: NEW JERSEY STATE AVERAGE

Location Modifier	Default	User	Reason for changes
	1.210	1.210	

Options
Database: Modified System Costs
Cost Database Date: 2016
Report Option: Fiscal

Description Cost Estimate for Remediation Action

Site Cost Summary Report
(with Markups)

Site:

ID: AOC12
Name: SWMUs 1,2,3,4,7,8,21,22,23,24,30,33,39,55-2,55-5,55-6,56)
Type: AOC

Media/Waste Type

Primary: Soil
Secondary: Groundwater

Contaminant

Primary: Semi-Volatile Organic Compounds (SVOCs)
Secondary: Volatile Organic Compounds (VOCs)

Phase Names

- **Pre-Study** ☐
- **Study** ☐
- **Design** ☑
- **Removal/Interim Action** ☑
- **Remedial Action** ☑
- **Operations & Maintenance** ☑
- **Long Term Monitoring** ☑
- **Site Closeout** ☑

Documentation

Description: AOC 12 was created to capture costs for the RACER model releated primarily to SWMU-8, which is not captured in any of the AOC 1-11 officially designated by DuPont and URS. This was necessary due to the depiction of conditions from the 2014 Comprehensive Facility Investigation which showed that the B-Aquifer impact at 20 ft thickness x SWMU acreage per reports and Figures 7-27, 28, 40, among others was impacted with NAPL and would require cleanup as indicated in regulatory correspondence and reports. Although surfactant enhanced recovery was included in previous work on SWMU-8, this approach is currently at the research stage, and could not be costed without further data produced. Thus the treatment train employed for other RACER AOCs was used for SWMU-8 cost predictions.

From the 2014 Fact Sheet for SWMU-8:
Description: SWMU 8, also known as former Landfill IV, is a 140-acre area that was the primary disposal site for wastes generated from the various operating areas of Chambers Works from approximately 1940 to 1975. These wastes included solid and semi-solid
wastes (bulk sludge and tars, basin and river dredgings, spent carbon and catalyst, fly ash, drummed powders, and asbestos), empty containers, construction debris and building rubble, trash and general refuse, soil fill, and liquid wastes (waste oil, spent solvents, etc.) and discarded machinery and equipment. A majority of these wastes were disposed in bulk form, however some wastes were disposed of in drums (steel or cardboard), barrels, or other containers. Operation of Landfill IV was the responsibility of the Chambers Works S&T Department. The S&T Department used approximately 21 narrow gauge sludge cars and 175 waste hoppers to collect process waste from all

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operating areas of Chambers Works for transport to Landfill IV (DuPont, 1989). In addition, the S&T Department managed activities within the Landfill IV area (now designated as SWMU 8), including recycling of scrap metal and empty containers, incinerating liquid chemicals and solid waste, and disposing non-process general trash. As the SWMU 8 area was filled in over time, additional operating areas were constructed on top of the filled areas. Landfills A and B were issued an NJDEP Certificate of Approved Registration (#1713B) on September 15, 1975. This landfill registration described the permitted material for disposal in Landfill A and B as follows:

"the elastromeric waste, oils, tars, silt, iron, hydroxide, aluminum hydroxide and iron oxide sludges. No radioactive materials, septic tank wastes, sewage sludge, or liquid or soluble chemicals may be disposed at this site."

On March 8, 1983, the certificate of registration was modified to allow the disposal of rubble, asbestos, plastic, bottom ash, and fly ash. Landfills A and B (SWMU 30) were constructed on top of SWMU 8. An evaluation of available historical records showed that approximately 178,000 containers were disposed of in Landfill IV between 1940 and 1975, and that drummed waste accounts for approximately 1% of the total fill volume within SWMU 8. Results of this evaluation including references to supporting documentation were submitted to NJDEP and EPA via electronic mail on February 9, 2004. DuPont has also reviewed available research on corrosion of buried drums to determine expected longevity of drums in SWMU 8 (Mutch and Sutherland, 1990; Mutch and Norris, 2001). Based on this research, site-specific conditions of SWMU 8, process knowledge of the historical drum disposal methods, and recent investigations, it is unlikely that any intact drums remain within SWMU 8.

Historically, the SWMU 8 area consisted of wetlands adjacent to Whopping John Creek prior to DuPont activities. Between 1900 and 1930, the SWMU 8 area was used for smokeless gunpowder storage associated with the Carneys Point Works. In 1940, the
initial filling operations commenced along the western edge of the SWMU 8 area. By1956, the Landfill IV area expanded to replace a majority of the Whopping John Creek marsh along the western portion of the area. Surface-water drainage from Whopping John Creek was diverted into a ditch that traverses the area.

Under the current state, the surface cover includes asphalt, concrete, gravel, foundation, and vegetation. The majority of the 140 acres is currently not in use. Extensive investigations as part of the SWMU 8 RI (CRG, 2005) show that the landfill units are stable and do not contain intact drums. The nature of the fill material in SWMU 8 (including the physical and chemical properties of the fill) and the detected constituents are consistent with past disposal practices. The current pump-and-treat system maintains hydraulic control of groundwater at the site and prevents off-site groundwater migration. [Thus depends on continued operation of IGW.]

SWMU 8 contains, in whole or in part, several individual SWMUs. The SWMUs and their descriptions are listed below.
SWMU Description: 1 Incinerator I, 2 Incinerator II, 3 Incinerator III, 4 Incinerator IV, 7 Landfill III, 17 Portions of the Process Water Ditch System, 20 Ethyl Chloride Incinerator, 21 Thermal decontamination incinerator (FR-65), 22 Multipurpose incinerator (FR-01), 23 Chemical waste tank area, 24 Chemical waste container storage areas A and B, 30 Landfills A and B, 33 Manhattan Project Area, 39-4 and 39-7 Underground Storage Tanks, 55-2, 55-5, and 55-6

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Fill Deposition Areas, 56A Portions of the Historical Process Water Ditch System.

The location of SWMU 8 and the other associated SWMUs are shown in Figure A-1. In addition, photographs taken in June 2007 are provided.

Size of Unit: 140 acres

Period of Use: 1940 to 1975

Remedial Action: None.

An Interim CMS and RASR for SWMU 8 was submitted (CRG, 2007). For the Interim CMS and RASR, SWMU 8 was divided into six areas:

Landfill A Area
Landfill B Area
Northern Basin Area
Northwestern Fill Area
Western Fill Area
Southern Fill Area

These areas have similar historical origins that can be readily demarcated from surrounding areas by physical boundaries, waste content, chemical characteristics, or a combination of these factors. The areas were identified based upon the following three criteria:

Mode of original placement and waste content based on aerial photograph review
Exceedance of applicable screening criteria that suggest potential contribution of constituents from soil to groundwater
Concentrations that would suggest the presence of NAPL

In addition, an additional forested area (11.3 acres) is located within the traditional boundary of SWMU 8. This area is not believed to be impacted because no manufacturing or waste management activities were conducted there.

The SWMU 8 CMS-RASR identified promising technologies to address significant sources that met the selection criteria (DuPont, 2007) for the Landfill A Area, the Northwestern Fill Area, and the Northern Basin Sub Area. Potential technologies were presented that could be implemented to mitigate groundwater impacts from source areas below the water table.

Characterization of the surface-water quality prior to entering and exiting SWMU 8 via concrete pipes under Landfill A was completed during six sampling rounds in 2006. No further sampling activities were recommended. Two surface-water features (C and D Ponds) located within SWMU 8 were evaluated, and results were presented in the Ecological Investigation Report (URS, 2009). No further evaluations were recommended for these areas.

A Treatability Study Work Plan was completed in 2009 to evaluate these remedial options. The Treatability Study RIR (URS, 2010) included sampling of groundwater and soil within the aquifer zones and confining units. This study

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concluded that characterization of the A/B and B/C discontinuities were complete; no additional stratigraphic investigations are necessary. Results of the biodegradation assessment indicated that anaerobic degradation is occurring in the B aquifer beneath SWMU 8.

A pilot test of surfactant-enhanced DNAPL recovery was recommended for the L13 boring area. The surfactant study was completed for the Northwestern Fill Area (L13) by Surbec Environmental in 2011.

Subsequently, additional groundwater sampling at and to the northeast of SWMU 8 was completed as part of the interior investigation activities (URS, 2013) and the RFI Data Gap Sampling conducted in early 2014. In the Comprehensive RFI
Report, the source prioritization tool, visual, soil saturation, and groundwater summed concentration-TAS ratios were evaluated in conjunction with each other to map probable and potential DNAPL source zones. Analysis of these results shows that the extent of DNAPL in the Northwestern Fill Area and to the north has been delineated as shown in Figure 7-28 of the Comprehensive RFI Report (URS, 2014) with no DNAPL source zones identified to the north of the Northwestern Fill Area.

Constituents: The evaluation of constituents within SWMU 8 that exceeded applicable criteria was based on the results of numerous investigations. Investigations pertaining to the SWMU areas within the SWMU 8 boundary were documented in previous RFI phases and referenced in their respective fact sheets. As part of the Comprehensive RFI Report (URS, 2014), constituents were evaluated at each location sampled within SWMU 8. For soil, NJNRDCSRS and NJIGWSRS were used for comparison. For groundwater, NJGWIIA were used for comparison. Detections for PFOA in soil were compared to the EPA Region 4 (2009) residential soil screening value. Detections in groundwater for PFOA and PFOS were compared to the Provisional Health Advisories developed by EPA (EPA, 2009). Figures and tables from the Comprehensive RFI were used to produce the summary tables presented in this Fact Sheet. The soil figures from the Comprehensive RFI present the locations throughout the manufacturing area where constituents exceeded NJNRDCSRS. The groundwater figures that were used from the Comprehensive RFI display by analyte group (i.e., VOCs, SVOCs, etc.), aquifer, and the constituents that most frequently exceeded the screening criteria by the greatest margin of exceedance for all locations within the entire manufacturing area. There may be additional analytes that exceed the screening criteria at each location, but only the analyte with the greatest exceedance margin is shown on the figures at each location and listed in the tables below.

Soil samples were collected (see the table below) to characterize soil at SWMUs, to assess biodegradation potential or to confirm the presence of potential historical sources within the AOC. Soil data related to SWMUs where soil was removed or remediated were not included. The soil table below provides a summary of the information presented in Appendix C.1 of the Comprehensive RFI Report (URS, 2014). Soil data collected within the extent of SWMU 8 indicate exceedances of NJNRDCSRS for VOCs, SVOCs, metals and pesticides/total PCBs. There were no PFOA or PFOS exceedances. Constituents that exceeded the NJNRDCSRS within SWMU 8 include the following.

VOCs SVOCs Metals

Site Cost Summary Report
(with Markups)

Pesticides/Total PCBs (76 locations) (27 locations)	PFOA/PFOS (71 locations) (3 locations)	(73 locations)
1,1,2-Trichloroethene	1,2,4-Trichlorobenzene	Arsenic
Dieldrin	No exceedances	
1,2-Dichlorobenzene	1,2-Diphenylhydrazine	Lead
Total PCBs	No detections	
Benzene	2,4-Dinitrotoluene	Mercury
Carbon Tetrachloride	2,6-Dinitrotoluene	Thallium
Chloroform	Benzo(a)anthracene	
Methylene Chloride	Benzo(b)fluoranthene	
Tetrachlorothene	Benzo(a)pyrene	
Trichloroethene	Bis(2-ethylhexyl)phthalate	
Vinyl Chloride	Bis(2-ethylhexyl)phthalate	
	Dibenz(a,h)anthracene	
	Hexachlorobenzene	
	Indeno(1,2,3-cd)pyrene	
	Naphthalene	
	Nitrobenzene	

Soil exceedances within SWMU 8 are localized and within areas that have sufficient ground cover to prevent exposure. Soil investigation related to SWMUs has been completed. Groundwater samples were collected at several locations (see the table below) from the B, C, D and E aquifers, respectively within the SWMU 8 boundary. Groundwater in SWMU 8 contains constituents above NJGWIIA with the B aquifer having the highest concentrations. In general, concentrations decrease with depth in the lower aquifers. The table below provides a summary of the information displayed in Figures 7-5 through 7-24 (excluding Figure 7-21) of the Comprehensive RFI Report (URS, 2014). Constituents that exceeded the screening criteria with the greatest margin of exceedance at each sampling location iinclude the constituents listed in the following table.

		B Aquifer	
VOCs	SVOCs	Metals	
Pesticides/ Total PCBs	PFOA/ PFOS		
(67 locations)	(63 locations)	(68 locations)	(44
locations)	(3 locations)		
Benzene	Aniline	Aluminum	Aldrin
Not Analyzed			
Chlorobenzene	Hexachlorobenzene	Antimony	Alpha-BHC
Trichloroethene	Nitrobenzene	Lead	Total PCBs
Tetrachloroethene	1,2,4-Trichlorobenzene	Other	4,4'-DDD
Vinyl Chloride	2-Naphythylamine		4,4'-DDE
1,2-Dichloroethane	2,4-Dinitrotoluene		Other
Other	4-Chloroaniline		
	Other		

			C Aquifer
VOCs	SVOCs	Metals	Pesticides/ Total
PCBs	PFOA/ PFOS		

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(12 locations)	(12 locations)	(12 locations)	(2 locations)
(3 locations)			
Benzene	Aniline	Antimony	Not Analyzed
PFOA/PFOS			
Chlorobenzene	2-Naphthylamine	Other	No Exceedabces/No
Detections	No Exceedances/No		4-
Chloroaniline			
Detections or not Analyzed			

D Aquifer

VOCs	SVOCs	Metals	Pesticides/ Total PCBs
PFOA/PFOS			
(5 locations)	(5 locations)	(4 locations)	(0 location)
(1 location)			
Benzene	Aniline	Other	NA
No Exceedances/No Detections			
1,2,4-Trichlorobenzene			

E Aquifer

VOCs	SVOCs	Metals	Pesticides/ Total
PCBs)	PFOA/PFOS		
(1 location)	(1 location)	(1 location)	(0 location)
(1 location)			

No exceedance/	No Exceedances/	No Exceedances/	NA
No Detections	No detection	No Detections	

DNAPL/NAPL: Evaluation of the exceedances and probable and potential DNAPL source zones in the B aquifer indicate that B aquifer groundwater is impacted beneath the entire SWMU-8 area. The current IWS likely creates more co-mingling of plumes from
multiple source areas toward IWS pumping wells located in the site interior. Residual DNAPL, as well as DNAPL diffused into finer-grained units, will likely continue to impact B aquifer groundwater. B-Aquifer impact at 20 ft thickness x AOC acreage per reports and Figures 7-27, 28, 40, among others. DNAPL is widespread in B-Aquifer as defined in Figures 7-1 through 7-24 of the Comprehensive RFI Report (URS, 2014).

Vapor Intrusion: If Buildings are present within the SWMU-8 area, they will be investigated over the next two years as requested by USEPA and NJDEP in 2016 of Chemours. No results thus far have been reported for SWMU-8.

Support Team: The TBLS Group, LLC

References:
SWMU 8 (Landfill IV) Remedial Investigation Report (DuPont, 2005)
Preliminary Assessment Report (CRG, 2006)
Revised Baseline Ecological Evaluation, (CRG, 2006)
SWMU 8 (Landfill IV) Remedial Investigation Report 2005 Addendum (CRG, 2006)
SWMU 8 (Landfill IV) Remedial Investigation Report – Surface Water Investigation 2007 Addendum. (CRG, 2007)
SWMU 8 Interim Corrective Measures Study and Remedial Action Selection Report (DuPont, April 2007)
SWMU 8 Treatability Study Work Plan (URS, 2009)
Ecological Investigation Report (URS, 2009)
Treatability Study Remedial Investigation Report (URS, 2010)
Interior Investigation Technical Memorandum (URS, 2013)
RCRA Facility Investigation Data Gap Sampling Plan (URS, 2013)
Vapor Intrusion Remedial Investigation Work Plan (URS, 2014) with data

Site Cost Summary Report
(with Markups)

Phase	Direct Cost	Markups	Total Cost
Design	$6,848,297	$0	$6,848,297
Removal/Interim Action	$60,641,268	$34,773,430	$95,414,698
Remedial Action	$2,305,577	$3,352,054	$5,657,630
Operations & Maintenance	$25,746,783	$26,707,409	$52,454,191
Site Closeout	$28,601	$49,981	$78,582
Total Site Cost	$95,570,526	$64,882,874	$160,453,399

EXHIBIT 13

Site Cost Summary Report
(with Markups)

System:

RACER Version: RACER® Version 11.3.18.0
Database Location: C:\Users\hhhoratio\Documents\RACER 11.3\RACER.mdb

Folder:

Folder Name: Meyner & Landis

Project:

ID: AM115
Name: Chemours Chambers Works Manufacturing Facility
Category: None

Location
State / Country: NEW JERSEY
City: NEW JERSEY STATE AVERAGE

Location Modifier	Default	User	Reason for changes
	1.210	1.210	

Options
Database: Modified System Costs
Cost Database Date: 2016
Report Option: Fiscal

Description Cost Estimate for Remediation Action

Site Cost Summary Report
(with Markups)

Site:

ID: AOC13
Name: SWMUs 17,17A,32A,32B
Type: AOC

Media/Waste Type

Primary: Soil
Secondary: Groundwater

Contaminant

Primary: Semi-Volatile Organic Compounds (SVOCs)
Secondary: Volatile Organic Compounds (VOCs)

Phase Names

- **Pre-Study** ☐
- **Study** ☐
- **Design** ☐
- **Removal/Interim Action** ☐
- **Remedial Action** ☐
- **Operations & Maintenance** ☐
- **Long Term Monitoring** ☐
- **Site Closeout** ☑

Documentation

Description: AOC 13 was created to capture costs for the RACER model related to SWMU 17, 17A, 32A, and 32 B. All these SWMUs have additional work to be done and no apparent AOC designation to capture the costs necessary to complete these tasks.

SWMU 17: A Ditch & Sidewalls

Description: The PWDS, identified as SWMU L 7, has been closed under a NJDEP Administrative Consent Order (Amended 988). The PWDS was used to transport waste to the basins or wastewater treatment plant. Sections of the ditch system have been remediated and are further described below.The PWDS is located throughout the production areas of Chambers Works.

Ditch section DI S2 was designated a hazardous section of the PWDS. D IS2 was located approximately 350 feet west of Ponsol Road between Broadway Road and Neoprene Road. DI S2 was 1,500 feet long and contained approximately 2,345 feet of tributaries that fed into the main ditch from the eastern side. This section is located in the center of the Chambers Works facility .

Size of Unit: Main Ditch Section D 1S2 is 1,500 feet long.

Period of Use: 1917 to 1992

Primary continued engineered control is the IGW, the CEA, and the plant exterior boundary fence which are listed as components that will continue to be in place

Site Cost Summary Report
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and operating.

Remedial Action: From 1993 to 1996, materia l was removed from the bottom of all ditch sections down to the groundwater table, including 3 inches of saturated soil as required by the NJDEP. The sidewalls of the ditch section were sampled approximately
1 foot from the edge of the d i tch and analyzed for specific target constituents. In addition, one sample from each ditch section was sampled for Appendix IX constituents and tentatively identified compounds. Inareas where sidewall sample concentrations exceeded the A Ditch sidewall soil clean-up criteria (10,000 mg/kg for total organic compounds and 1,000 mg/kg for TVOCs, per 1993 NJDEP correspondence), delineation samples were collected 25 feet on either side of the initial sample. Any area of sidewall soil that contained constituent concentrations greater than the soil cleanup criteria was removed to a maximum distance of one foot from the side of the ditch.

For DI S2, an estimated 4,740 cubic yards of ditch material and soil were removed from the ditch. Most sidewalls were left in place in accordance with. the Process Water Ditch System Remediation Plan, except for a 50-foot length of sidewall that exceeded
NJNRDCSCC for arsenic.

After excavation and treatment were completed, the PWDS was replaced with a system of pipes and asphalt swales. The replacement system is currently used for collection and conveyance of noncontact cooling water, stormwater runoff, and emergency conveyance of process waste to the wastewater treahnent plant iJ1the event of a catastrophic incident (note: The PWDS has never been used for emergency purposes). Stonnwater run-off surges that are conveyed by the replacement system
are routed to "B" Basin through a spillway constructed in May 1996. Once the replacement system was installed, the excavated ditch was brought to grade with clean fill and covered with gravel.

SWMUs Sa to 1702S11.doc
SWMU 17 - DITCH SECTION D1S2

Constituents: Based on the resu lts of characterization sampling in J 993, arsenic and various semi-volati les were identified as COPCs for DIS2. During the Phase II RFI, one sample was collected from both sides of the ditch section to confirm horizontal delineation. Samples were analyzed for the target COPCs along with SPLP for these COPCs and TOC. These samples were collected in the subsurface just above the water table (2-foot depth). Only one sample location had concentrations that slightly exceeded the NJNRDCSCC as shown below.

Constituent	Soil Concentration (mg/kal	NJNRDCSCC (mg/kal
2,6-Dinitrotoluene	5.5	4
2,4-Dinitrotoluene	4.5 J	4

No constituent concentrations exceeded NJIGW. In addition, the SPLP results did not exceed NJGWIIA in either of the samples. Groundwater was not sampled for this SWMU.

Institutional Controls:
- o Plant security controls access on-site and to SWMU 17 -Ditch Section DI S2.
- o Plant and Area orientations are required for work in SWMU 17 -Ditch Section

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DI S2.
o Plant permits are required for work in SWMU 17 -Ditch Section DIS2. The plant permit process is a defined process in which locations where work will be performed are checked against site-wide maps. All available site environmental data, soil characterization, and utility information are also reviewed to ensure appropriate PPE is being used.
o Closure and Post Closure Groundwater/Remediation Requirements are specified in the Chambers Works NJPDES-DGW Permit No. NJ0083429.
o A site-wide deed notice will be established for the entire facility.
o The Chambers Works plant has two approved groundwater CEAs that cover the entire site. CEA 1 covers groundwater south of Henby Creek, and CEA 2 covers groundwater north of Henby Creek.

Engineering Controls:
o A fence surrounds the Chambers Works site.
o A protective cover (i.e., backfill and gravel) will be maintained.
o Groundwater at Chambers Works is addressed on a site-wide basis (as opposed to SWMU by SWMU) and is centered around a very large pmnp-and-treat system (average pumping of 1,500,000 gallons/day) referred to as the IWS. A semi-annual report is generated and sent to the NJDEP that documents the operation, maintenance, system status, and groundwater monitoring data related to the IWS in compliance with NJPDES Permits NJ0083429 and NJ0105872. DuPont will continue to operate the
IWS to control site groundwater as required by NJPDES-DGW Permit No. NJ0083429 and HSWA Permit No. NJ002385730.

Exposure Assessment Summary: SWMU 17- Section DIS2 is a portion of the PWDS that was used to transport waste to the basins or wastewater treatment plant. SWMU 17 - Section D 1S2 underwent remedial action. As previously detailed, the bottom of the unit w:::i s rf>:mP:rli:::i tP:ci tn thP: w:::i tP:r t:::ihh inr.Inclino- 1 inr.hP:s nf s:::it11r::1tP:i1 sni L ::i nil ;:::inv Hre:i of gravel.

Subsurface soil samples collected adjacent to the ditch sidewalls during the Phase II RFI indicated that constituents were detected in only one location at concentrations that approximated or slightly exceeded the NJNRDCSCC.

Under current conditions, the existing surface cover (gravel) provides a barrier to prevent worker exposure. In addition, institutional controls (i.e., plant security, plant work permits, plant and area orientations, and the PPE requirement) are in place to further eliminate potential exposure to underlying soil. Since constituents were not detected in the soil above NJ1GW and were not detected in the SPLP leachate, impact to groundwater is not a potential concern. As indicated, groundwater is controlled by the IWS and is evaluated on a site-wide basis. Since groundwater is not used for any purposes inthe SWMU 17 - Section D182 area, there is no exposure to groundwater.

SWMU 17-DI S2 is located within an active portion of the plant. The unit is entirely covered with hard surface (gravel), which provides no ecological habitat.

Summary, remediation of tbe ditch has been completed, and only one subsurface soil sample indicated the presence of constituents slightly above screening criteria. However, the existing surface cover in this area provides a protective barrier that eliminates potential exposure. The surface cover will be inspected annually. Under this current scenario, there is no potential concern for human health and the environment. Therefore, further remedial activities at

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SWMU 17 - Section D1S2 are not warranted.

Restrictions: No intrusive work will be conducted in SWMU 17 -Ditch Section D1S2 without the proper area orientations and plant and area permits.

Maintenance Requirements:
o Inspect gravel cover annually.
o Correct any deficiencies based on inspection findings. o Maintain inspection records on file.

Biennial Inspection Requirements:
o Review inspection logs every two years for use in biennial reporting.
o Ensure maintenance has been completed and insufficiencies are corrected.
o Submit a Biennial Inspection Report pursuant to the Technical Requirements for Site Remed iation NJAC 7:26E-6.6et.seq.

NAPL in SWMU 17 which crosses many AOC boundaries is captured in all AOCs 1-11, and other AOC's created for this RACER estimate. Thus costs included in this AOC mainly relate to SWMU specific site close-out, closure, and post closure care which might be required in the future.

SWMU 17 - DITCH SECTION D1S2 A DITCH AND SIDEWALLS

References :
DuPont Corporate Remediation Group. December 2006. Preliminary Investigation Report.

DuPont Corporate Remediation Group. September 2006. Revised Basebne Ecological Evaluation. Pages
iv, 6 and 30.

DuPont Corporate Remediation Group. October 2, 1998. Phase JI RCRA Facility Investigation Report.
Pages 7-10 and 7-11.

DuPont Environmental Remediation Services. Apri l 30, 1996. Process Water Ditch System Closure
Certification Report.

E.I. du Pont de Nemours and Company. May 12, 1989. Description a/ Current

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(with Markups)

Conditions. Pages 29 and
30.

New Jersey Department of Environmental Protection. November 12, 1993.
Process Water Ditch System
Closure Letter.

Fact Sheet Date: August 31, 2007

2014 Fact Sheet:

Constituent concentrations were also compared to NJIGW. The following constituents
were detected at concentrations that exceeded NJIGW.

Constituent	Soil Concentration (mg/kg)	NJIGW (mg/kg)
Benzene	ND to 8.8	
1		
Chlorobenzene	26 to 140	1
1,2-DCB	0.25 J to 3400	50
1,4-DCB	ND to 210	100

In addition, the SPLP results were compared to NJGWIIA. The following constituents have SPLP
concentrations that exceeded NJGWIIA in both samples.

Constituent	SPLP Concentration (µg/L)	NJGWIIA (µg/L)
Benzene	ND to 120	
1		
Chlorobenzene	2 J to 2800	50
1,2,4-trichlorobenzene	ND to 81	9
1,2-DCB	9 J to 45,000	600
1,4-DCB	ND to 3600	75
Nitrobenzene	ND to 180	6

Which show that continued operation of the IGW is warranted.

SWMU 32A&B – Co-Generation Facility Area A

History: Buildings within the SWMU 32A area were used to store explosives, primarily nitrocellulose and gunpowder, produced at the former Carneys Point Works (1900-1920s). These buildings may also have stored materials used in the production of nitrocellulose and gunpowder such as ether, nitrotoluenes, nitric acid, amines, nitroglycerine salts, or sulfuric acid. Explosive materials were removed around 1920. In 1974, fill material from the WWTP construction was placed in this area based on aerial photographs. In 1991, construction of a 262 mega-watt pulverized coal fired Cogeneration facility began in the SWMU 32A area. The facility began commercial operations in 1994, providing electricity to Atlantic City Electric and DuPont. The facility also provides steam to the Chambers Works plant. SWMU 32A is located in the east-central section of the Chambers Works plant as shown in Figure A-1. The area is currently covered with asphalt or gravel and is the location of the coal pile and conveyor belts for the Co-generation Facility. SWMU 32A is currently operated as a coal storage area for the co-generation facility.

Site Cost Summary Report
(with Markups)

Size of Unit: 9.5 acres

Period of Use: 1900 to 1920

Buildings within the SWMU 32A area were used to store explosives, primarily nitrocellulose and gunpowder, produced at the former Carneys Point Works (1900-1920s). Explosive materials were removed around 1920. In 1974, fill material from the WWTP construction was placed in this area based on aerial photographs. SWMU 32A was investigated in June 1990 and January 1991 prior to construction of the co-generation facility. Soil sampling was conducted to confirm the complete removal of all explosives material from this location. All constituent concentrations were found to be below the NJNRDCSCC. This area is currently covered
with asphalt or gravel, therefore, potential exposure to soil is minimized. Since constituents were not detected above criteria in the soil, impact to groundwater is not a potential concern.

Support Team: The TBLS Group, LLC

References:
URS 2010, 2014 Fact Sheet.
AECOM Fact Sheet 2014
Second Semester 2015 NPDES/DGW Report, 2016, AECOM
CRG. December 2006. Preliminary Assessment Report.
CRG. September 2006. Revised Baseline Ecological Evaluation.
CRG. October 2, 1998. Phase II RCRA Facility Investigation Report. Pages 7-8 and 7-9.
DERS. April 30, 1996. Process Water Ditch System Closure Certification Report.
DuPont. May 12, 1989. Description of Current Conditions. Pages 29 and 30.
NJDEP. November 12, 1993. Process Water Ditch System Closure Letter.
URS. 2014. Comprehensive RCRA Facility Investigation Report. DuPont Chambers Works Complex, Deepwater, New Jersey.

32 A&B:
CRG. December 2006. Preliminary Assessment Report.
CRG. September 2006. Revised Baseline Ecological Evaluation. Pages iv, 6 and 30.
Dames and Moore. April 1991. Environmental Due Diligence Study Proposed Cogeneration
Facility.
DERS. December 18, 1992. Current Conditions Report – Volume II – SWMU Summaries.
DuPont. May 12, 1989. Description of Current Conditions. Page 46.
DuPont Engineering. October 1990. Chambers Works SWMU 32 Soil Investigation.
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1991.
OHM Remediation Services Corporation. July 1991. Report for the Subsurface Investigation – SWMU 32 – at the DuPont Chambers Works Facility.
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W.W. Bowen. January 1991. Chambers Works SWMU 32 and Proposed Co-generation
Facility Investigations.

Site Cost Summary Report
(with Markups)

URS. 2014. Comprehensive RCRA Facility Investigation Report. DuPont Chambers Works Complex, Deepwater, New Jersey.
URS, 2010, 2014 Fact Sheet

Estimator Information

Estimator Name: Jeffrey Andrilenas
Estimator Title: EVP
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Estimate Prepared Date: 12/04/2016
Estimator Signature: _____ **Date:** 12/4/2016

Reviewer Information

Reviewer Name: Paul Scian
Reviewer Title: Principal Analyst/Hydrogeologist
Agency/Org./Office: The TBLS Group LLC
Business Address: 25 South Road
Telephone Number: (973) 750-1500, ext 2
Email Address: pauls@thetblsgroup.com
Date Reviewed: 12/04/2016
Reviewer Signature: _____ **Date:** 4 Dec 2016

Site Cost Summary Report
(with Markups)

Phase	Direct Cost	Markups	Total Cost
Site Closeout	$823,589	$1,199,366	$2,022,955
Total Site Cost	$823,589	$1,199,366	$2,022,955

EXHIBIT 14

Site Cost Summary Report (with Markups)

System:

RACER Version: RACER® Version 11.3.18.0
Database Location: C:\Users\hhhoratio\Documents\RACER 11.3\RACER.mdb

Folder:

Folder Name: Meyner & Landis

Project:

ID: AM115
Name: Chemours Chambers Works Manufacturing Facility
Category: None

Location
State / Country: NEW JERSEY
City: NEW JERSEY STATE AVERAGE

Location Modifier	Default	User	Reason for changes
	1.210	1.210	

Options
Database: Modified System Costs
Cost Database Date: 2016
Report Option: Fiscal

Description Cost Estimate for Remediation Action

Site Cost Summary Report
(with Markups)

Site:

ID: AOC14
Name: Wastewater Treatment Plant (WWTP)
Type: AOC

Media/Waste Type

Primary: Soil
Secondary: Groundwater

Contaminant

Primary: Semi-Volatile Organic Compounds (SVOCs)
Secondary: Volatile Organic Compounds (VOCs)

Phase Names

- **Pre-Study** ☐
- **Study** ☑
- **Design** ☑
- **Removal/Interim Action** ☑
- **Remedial Action** ☑
- **Operations & Maintenance** ☑
- **Long Term Monitoring** ☑
- **Site Closeout** ☑

Documentation

Description: AOC 14 was created to capture subsurface source area NAPL cleanup costs which was were depicted in the 2014 Comprehensive Facility Intestigation to Figures showing NAPL distribution to cover a substantial amount of the area of the WWTP facility. Includes treatment of NAPL source area and B Aquifer below WWTP & NAPL Cleanup. These costs would not be captured by any of the existing AOCs nor by closure/post closure costs reserved under the hazardous waste operating permit. Groundwater hydraulic control is reported to be achieved by the IGW system according to reports reviewed, although some contaminants have apparently escaped capture to the east of AOC 14 including PFOAs.

From the 2006 PAR: The Wastewater Treatment Plant (WWTP) FA is about 80 acres in the central portion of the site and is bounded by the Carneys Point AOC to the north, the Cogeneration FA to the east, the Basins AOC to the west, and the SWMU 8 AOC to the south. The WWTP AOC has been divided into three subareas: SWMU 18 (WWTP), Rail Yard Area, and Western Area. Several of these areas have been previously investigated and/or remediated. These areas are listed below and included only in the history section of this AOC SWMU 17: PWDS (sections within SWMU 18) SWMU 18: WWTP SWMU 18A: WWTP Pump Pit. For simplicity sake, TBLS has separated out all the included SWMUs into separate AOCs, and included the WWTP, Rail Yard, and Western Area into the WWTP AOC, AOC 14.

From the 2006 PAR: The WWTP FA was originally part of Carneys Point Works. Activities in this area involved the production of nitrocellulose and smokeless gunpowder and are discussed in detail in Section 20. During the peak of World

Site Cost Summary Report
(with Markups)

War I production Carneys Point Plant 3 and a portion of Plant 2 were located in this area, as well as storage bunkers, roads, and narrow-gauge railways. The area was abandoned and most of the buildings were removed shortly after the end of the war because of the decreased demand for nitrocellulose and smokeless gunpowder.

AOC 14 WWTP: From 1919 to 1970, the only activity in the area was related to six nitrocellulose storage bunkers. These structures were removed before 1970 during initial land clearing for construction of the WWTP. In 1971, DuPont began building a wastewater treatment pilot plant to comply with the DRBC implementation of the 1965 CWA. Additions to the plant were constructed between 1972 and 1975, and wastewater treatment began full-scale operations in 1975. During construction, fill was brought in as a construction base to increase the ground elevation roughly 5 feet. As a RCRA Part B operating unit, the WWTP was designated as SWMU 18.

From 1983 Part B Permit Application : In accordance with 40 CFR 265.I (1) (10) the Chambers works WWTP (covered by NPDES Permit #0005108) is "exempted from the provisions of RCRA regulations; however, since NJAC 7: 26-9.I (C) does not contain a similar exemption", the following information is provided. GENERAL Information contained herein covers the liquid aqueous waste treatment plant only. The WWTP is operating under NPOES Permit #0005108. The plant consists of two phases. ,Phase I Primary Treatment has two functions; one, to neutralize normally acidic wastewater so that discharge pH standards can be met and to provide a neutral waste-water for the second phase biological treatment. The stream is acidic and contains normally 100-300 mg/l of organic material at a specific gravity of 1.000. In the process of neutralization, solids are produced that are flocculated and settled in the primary clarification system. The settle solids are then removed and processed through filter presses and then deposited in a secure landfill. Pumps located in the ditch system pump liquia waste to each of three neutralizers where lime is added via pH control. From this point on to the end of the process, the flow is by gravity. Once neutralized the flow passes by a flow splitter, then to flocculators and primary clarifiers. The supernatant from primary clarification then flows to a second splitter where the flow is divided into three aerator tanks. Aeration tanks provide retention time for biological organisms to breakdown the organics in the stream to co2-H2o . The flow then passes onto another flow splitter where the flow is split between two secondary layers. Biological growth settles to the bottom of the clarifier and then is returned to the aerators via the return activatea sludge pumps. The supernatant from the secondary clarifier is the finished treated water.

From the 2006 PAR: Beginning in the 1990s, the WWTP was upgraded to meet more stringent environmental regulations (e.g., a third secondary clarifier and a tertiary treatment step were added). Currently, the WWTP accepts aqueous nonhazardous and RCRA hazardous waste (characteristic and listed D, F, K, P and U codes). Industries that send waste to the WWTP include chemical, pharmaceutical, petroleum refining, paints and coatings, primary metals production, galvanizing, electroplating, printed circuit board manufacturing, and utilities.

Waste sources include the following:

- Process waste
- Equipment cleaning and decontamination waters
- Pollution control systems

Site Cost Summary Report
(with Markups)

Spent acids and caustics
Spill control and stormwater control systems
Condensates
Groundwater, leachates, and remediation systems
Biosludges
Discarded or off-specification products

The primary system neutralizes the acidic waste streams, pre-treats outside wastes, precipitates out heavy metals, adds polymers to assist in settling of solids, and removes sludge prior to secondary treatment. In the secondary system, bacteria, carbon, and air
work together to begin the biodegradation of the organics in the waste streams. Some nonbiodegradable organics are adsorbed on the surface of the carbon in the secondary treatment. The tertiary system further treats the wastewater stream by biodegradation and carbon adsorption. The quality-treated effluent from the tertiary is then mixed with cooling water at the outfall and discharged into the Delaware River. Solids from the Secondary and Tertiary systems are filtered through a filter press and sent to the Chambers Works Secure Landfill. For inorganics, the waste treatment process involves the following:

Neutralization and precipitation
Heavy metal pretreatment/metal hydroxide precipitation
Sulfide pretreatment

For organics, the waste treatment process involves the following:
Powder activated carbon treatment (PACT) – biological and carbon adsorption treatment
Steam stripping/organic recovery (completed in TEL FA)
Phase separation (completed in TEL FA)

Organic wastes that are accepted include priority pollutants, ignitable constituents (D001), halogenated and non-halogenated solvents, multi-phase, and organic acids. The DuPont Secure Environmental Treatment (SET) Wastewater Treatment Facility is
currently operated in accordance with NJPDES Permit No. NJ00051000, which became effective October 1, 2005, and expires on September 30, 2010. The operating areas of the WWTP are paved with asphalt, and stormwater in the area is conveyed to the treatment system.

Rail Yard Area: Prior to 1919, the Rail Yard area was associated with Carneys Point Works Plant 2 as the location of a solvent alcohol recovery unit and associated structures. From 1919 to 1952, there was no activity in the area. In 1952, this area received dredge spoils from the dredging operations in the wastewater basins to the west. This dredged material was primarily deposited in the SWMU 8 FA to the south, but a portion was placed in the Rail Yard area, as defined by an earthen dike delineating the dredge spoils area. Additional fill placement occurred in the area between 1953 to the mid-1960s. The initial Rail Yard was constructed in 1968 and expanded between 1969 and 1974. An interceptor well (Q13-R01CD) was installed around 1970, and the southern portion of the area began to be used as the railroad laydown area prior to 1976. This area is currently used as a railcar storage yard and as a laydown area for railroad equipment (railroad ties, spikes, rails, and related hardware). There are no SWMUs currently associated with this area, but it shares a common fill deposition history with SWMU 8, which is directly south.

Site Cost Summary Report
(with Markups)

Western Area: Before 1919, the Western area was associated with Carneys Point Works Plant 3 and included the central portion of the plant, specifically the powerhouse, main office, and various operating buildings, shops, and associated structures. These buildings were removed around 1920, leaving behind only foundations. The other significant feature in the area was related the wastewater basin located to the west. Most of this area is part of AOC 5.

Because of the presence at Waste Water Treatment Plant AOC of NAPL, as shown in the 2014-2016 Comprehensive RFI Report (MANUFACTURING AREA B AQUIFER GROUNDWATER TOTAL AQUEOUS SOLUBILITY LINE OF EVIDENCE FOR DNAPL MAP) the previous proscribed NAPL impacted treatment train has been costed as part of the remediation activities based on the mass balance and areal extent map. Closure following cessation of Groundwater P&T and cessation of site activities would also be necessary, whichever is later. B-Aquifer impact at 20 ft thickness x approximate AOC acreage x percentage of acreage that has NAPL presence per reports and Figures 7-27, 28, 40, among others.

Vapor Intrusion: Vapor intrusion studies for occupied buildings will be carried out over the next two years per agreement between Chemours, NJDEP, and USEPA and costs are ideally captured in AOC 20.

Support Team: The TBLS Group, LLC

References: CRG. 2006. Preliminary Assessment Report. DuPont Chambers Works Complex, Deepwater, New Jersey.
URS. 2014. Comprehensive RCRA Facility Investigation Report. DuPont Chambers Works Complex, Deepwater, New Jersey.
URS 2011. Delaware River Remedial Investigation Report. DuPont Chambers Works, Deepwater, New Jersey.
URS. 2010. Perimeter Investigation Report. DuPont Chambers Works Site, Deepwater, New Jersey. August 2010.
RCRA Part B Applicaton, 1983
Second Semester 2015 NPDES/DGW Report, 2016, AECOM

Estimator Information

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Estimate Prepared Date: 12/04/2016
Estimator Signature: _____ **Date:** 12/4/2016

Reviewer Information

Reviewer Name: Paul Scian
Reviewer Title: Principal Analyst/Hydrogeologist
Agency/Org./Office: The TBLS Group LLC

Site Cost Summary Report
(with Markups)

Phase	Direct Cost	Markups	Total Cost
Design	$2,424,209	$0	$2,424,209
Remedial Action	$25,444,558	$16,244,681	$41,689,239
Operations & Maintenance	$6,263,339	$4,772,612	$11,035,952
Site Closeout	$1,262,230	$1,918,304	$3,180,533
Total Site Cost	$35,394,336	$22,935,598	$58,329,933

EXHIBIT 15

Site Cost Summary Report
(with Markups)

System:

RACER Version: RACER® Version 11.3.18.0
Database Location: C:\Users\hhhoratio\Documents\RACER 11.3\RACER.mdb

Folder:

Folder Name: Meyner & Landis

Project:

ID: AM115
Name: Chemours Chambers Works Manufacturing Facility
Category: None

Location
State / Country: NEW JERSEY
City: NEW JERSEY STATE AVERAGE

Location Modifier	Default	User	Reason for changes
	1.210	1.210	

Options
Database: Modified System Costs
Cost Database Date: 2016
Report Option: Fiscal

Description Cost Estimate for Remediation Action

Site Cost Summary Report
(with Markups)

Site:

ID: AOC15
Name: Site Groundwater Containment & Treatment
Type: AOC

Media/Waste Type

Primary: Groundwater
Secondary: Free Product

Contaminant

Primary: Multi-Contaminant
Secondary: Multi-Contaminant

Phase Names

Pre-Study ☐
Study ☐
Design ☐
Removal/Interim Action ☐
Remedial Action ☑
Operations & Maintenance ☑
Long Term Monitoring ☑
Site Closeout ☑

Documentation

Description: AOC 15 created for RACER cost estimate to capture costs not included in other AOC's related to cost for IGW pumping operation & maintenance, annual Operation, and Site-wide Groundwater Monitoring. AOC 15 has greatest influence on Cost Over Time as it is projected to continue for at least 270 years if not more.

Area-wide groundwater pump and treat using interceptor groundwater wells to pump and/or influence each of the 5 aquifers (although additional studies related to the E-aquifer are still ongoing) to maintain positive control over the site. Treatment is done onsite at the Chemours Wastewater Treatment plant. DuPont operates a commercial wastewater treatment plant operating under a RCRA Part B Permit, which accepts the majority of the liquid hazardous waste from the State of New Jersey and from other nearby states according to documents reviewed. The wastewater treatment plant utilizes powdered activated carbon for the treatment of wastewater, in addition to steam stripping, aerobic/anaerbic bio, and has a tertiary treatment system. The treated water is discharged into the Delaware River in accordance with NJPDES/DSW Permit No. NJ0005100.

Under natural ground water flow conditions, the Delaware River may be a recipient of a portion of ground water flow from the "B" aquifer underlying the DuPont facility. In response to identified ground water contamination, DuPont installed an interceptor well system (IWS) in 1970 designed to collect ground water and restrict the off-site migration of ground water for the protection of human health and the environment. Recently, DuPont has optimized the pumping rate of the IWS, by installing a perimeter along the Salem Canal and along the Delaware River on the perimeter of AOC 1, AOC 2, and AOC 3 of

Site Cost Summary Report
(with Markups)

sheetwall/slurry wall cut offs. DuPont was pumping over 1.5 million gallons per day previously. The collected ground water is treated at tbe DuPont on-site wastewater treatment plant and is ultimately discharged in accordance with their NJPDES-DSW Pennit No. NJ0005 I 00 to the Delaware River with tbe rest of tbe approximately 15 millllion gallons per day of treated wastewater. The capacity of the wastewater treatment plant is 30 million gallons per day. An administrative consent order was negotiated between NJDEP and DuPont in 1984 which contains the requirement to utilize the IWS to contain ground water necessary for the protection of human health and the environment, however Chemours has announced that the ACO is in effect ended.

The Site Groundwater Contaminment and Treatment System also operates with New Jersey Discharge to Groundwater (DGW) Permit and the area of influence is within a Conditionally Exempt Aquifer (CEA) land-use restiction restriction.Any facilities that discharge pollutants to ground waters of the State require a New Jersey Pollutant Discharge Elimination System (NJPDES) - Discharge to Ground Water (DGW) permit. The state rule that sets forth the requirements on elibility, procedures for obtaining, and general conditions for maintaining a NJPDES-DGW permit are in N.J.A.C. 7:14A. The goal of the NJPDES-DGW permitting program is to restore, enhance and maintain the ground water quality of New Jersey. This goal is achieved pursuant to the Water Pollution Control Act and the Ground Water Quality Standards (GWQS), Portions of the Chambers Works facility are currently under operations. The groundwater in these areas (A and B Sanitary Landfills and Cells 2, 3, 4, and 5A of the Secure C Landfill) is monitored under the NJPDES-DGW Permit NJ0105872. DuPont is required to pump the R20-M01B and Q20-M02B, respectively at 6 and 7 gpm to control the plume at Cell 1 of the Secure C Landfill. DuPont is required to pump well J05-W01E at a sufficient rate of approximately 200 gpm to hydraulically contain groundwater along the southern perimeter of Chambers Works to be protective of human health and the environment.

Groundwater quality exceedances are present throughoutthe CEA per ongoing environmental investigations and studies as well as semi-annual monitoring. Potential contaminanants escaping hydraulic control to East in Pennsville and Carney Point neighborhood (PFOA/PFOS), to south under Salem Canal, to west into Delaware River, and to north into Carney's Point AOC. Also suspect leakage/capture with depth in E Aquifer make the claim that the IWS has hydraulic control, suspect. In August 2010, The Perimeter Investigation Report (URS, 2010), was submitted to the NJDEP and EPA. The investigation identified three shallow groundwater plumes in the manufacturing area that may migrate to the Delaware River as a result of incomplete capture of the B aquifer by the IWS. The plumes were noted to be located in the Fluoroproducts Area (AOC 1), former Tetraethyl Lead (TEL) Area (AOC 2) and the in the western portion of the Jackson Lab area (AOC 3). Nonetheless, until source removal of all mobile contaminants is completed, the IWS operation will continue to be necessary. By straight line regression analysis using DuPont's data only, and assuming a treatment train contemplated in this RACER analysis for source control, this may take upwards of 300 additional years or more.

NAPL: NAPL recoveries of upwards of over 20,000 gallons has occured since the IGW has been put into operation. NAPL recovery continues principally by bailing. No automatic NAPL system has been designed or utilized to date. Evaluation of the exceedances and probable and potential DNAPL source zones in the B aquifer indicate that B aquifer groundwater is impacted beneath most of the Chambers Works Manufacturing Facility based on Figures provided in the

Site Cost Summary Report
(with Markups)

2014 Comprehensive Facility Investigation. The current IWS likely creates more co-mingling of plumes from multiple source areas toward IWS pumping wells located in the site interior. Residual DNAPL, as well as DNAPL diffused into finer-grained units, will likely continue to impact B aquifer groundwater as well as C-Aquifer and D-Aquifer and therefore extend the time-frame necessary to operate the IWS which is reflected in cost over time for both groundwater pump and treat operation and maintenance costs as well as for long-term monitoring costs. B-Aquifer impact is widespread across most of the AOC's which the IWS supposedly maintains hydraulic control per reports and Figures 7-7 thru 7-27, 28, 40, among others. However, groundwater plumes are co-mingled, heterogeneous. Tthe current IWS system does likely creates more comingling of plumes from multiple source areas toward IWS pumping wells located in the site interior. Residual DNAPL, as well as DNAPL diffused into finer-grained units, will likely continue to impact B aquifer groundwater. Impacts to the C aquifer are far less in terms of the magnitude of groundwater concentrations and the margins of exceedances and are also limited to the northwestern half of the AOC. In general, the D aquifer is less impacted than the C aquifer.

Long-term monitoring: 100 wells are currently being monitored and this number is likely to increase with additional Areas of Concern still being investigated. In addition it is anticipated that several offsite wells still need to be added to the long-term monitoring network. In addition, currently the site monitoring is on a semi-annual basis. Based on the severity of the conditions at this site (wide-spread NAPL, affecting potentially several aquifers, offsite AOCs, multi-contaminants, presence of PFOA/PFOS with the most stringent EPA Safe Drinking Water Level in history, etc., it is likely that this frequency of monitoring events will continue for some time if not indefinitely. This was anticipated in the RACER cost estimate.

In compliance with the NJPDES-DGW Permit Nos. NJ0083429 and NJ0105872, 94 wells were sampled for the six groundwater monitoring programs below (see Table 4 and Figure 3). Some of the wells are sampled under multiple monitoring programs. The
programs for the second semester of 2015 include the following:
– Closure and Post-Closure Groundwater Monitoring Program for the A, B, and C Basins (seven wells) (Permit No. NJ0083429) (see Section 5.1)
– PMP (38 wells) (Permit No. NJ0083429) (See Section 5.2)
– Post Closure Monitoring for RCRA Units (four wells) (Permit No. NJ0083429) (see Section 5.3)
– Perfluorooctanoic Acid (PFOA) Monitoring Program (36 wells) (Permit No. NJ0083429) (see Section 5.4)
– Secure C Landfill Corrective Action Monitoring Program (five wells) (Permit No. NJ0105872) (see Section 5.5)
– Secure C Landfill Detection Monitoring Program (four wells) (Permit No. NJ0105872) (see Section 5.6)
Groundwater quality is monitored in two wells (S24-M01B and T22-M01B) to characterize background for both corrective action and detection monitoring programs at the Secure C Landfill. The following program did not require sampling during this reporting period as outlined in Table 4:
– Leachate Collection System Monitoring Program (Permit No. NJ0105872) (see Section 5.7)

Table 4 summarizes the groundwater sampling schedule. The table denotes the required sampling locations, analytes, frequency, and the scheduled sampling event. Each monitoring program is listed separately. Parts 1 through 5 of Table 4

Site Cost Summary Report
(with Markups)

refer to the
Corrective Action groundwater monitoring programs (No. NJ0083429). Part 6 refers to Post-Closure Monitoring for the RCRA Units, while Parts 7 and 8 refer to the detection monitoring and leachate characterization for Areas 2, 3, 4, 5A, 5B, and 7 of the Secure
C Landfill (No. NJ0105872). Part 9 refers to the PFOA Monitoring Program.

NJPDES-DGW Permit No. NJ0083429, modified May 1, 2006, requires the monitoring of 33 wells for PFOA. Results are to be submitted to NJDEP within 90 days of sampling and are currently included in the semi-annual monitoring program. The PFOA Monitoring Program monitors 36 wells for 13 perfluorinated compounds (PFCs) semi-annually in compliance with NJPDES-DGW Permit No. NJ0083429. In 2014, and addition 14 wells were added to this effort. Based on correspondence and actions in 2016, it is likely that more wells will be required to be added to this program including offsite wells to the east, south, and west.

Support Team: The TBLS Group, LLC

References: DGW/NJPDES Permit Renewal Applications and correspondence - 2015-2016, Waste Water Treatment Plant Focus Area, 2006 Preliminary Assessment. AECOM, NJPDES-DGW Permit Numbers NJ 0083429 and NJ 0105872, First Semester 2015 Semi-Annual NJPDES-DGW Report, Chemours Chambers Works, Deepwater, NJ, 2015,
Second Semester 2015 NPDES/DGW Report, 2016, AECOM
(2002-2014 NPDES/DGW Semi-annual Monitoring Reports) URS
Remediation Correspondence 2014-2016 between NJDEP, US EPA, and Chemours/DuPont.
CRG, "Ground Water Remediation & RCRA Post Closure Plan, NJPDES-DGW, PERMIT NO. NJ0083429, DuPont Chambers Works, Deepwater, New Jersey", 2004.

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Estimator Signature: _____ **Date:** 12/5/16

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Date Reviewed: 12/05/2016
Reviewer Signature: _____ **Date:** 5 Dec 2016

Site Cost Summary Report
(with Markups)

Phase	Direct Cost	Markups	Total Cost
Remedial Action	$7,103,860	$3,541,274	$10,645,134
Operations & Maintenance	$225,702,613	$50,789,496	$276,492,109
Long Term Monitoring	$130,809,520	$67,664,143	$198,473,663
Site Closeout	$244,176	$159,088	$403,265
Total Site Cost	$363,860,169	$122,154,001	$486,014,170

EXHIBIT 16

Site Cost Summary Report (with Markups)

System:

RACER Version: RACER® Version 11.3.18.0
Database Location: C:\Users\hhhoratio\Documents\RACER 11.3\RACER.mdb

Folder:

Folder Name: Meyner & Landis

Project:

ID: AM115
Name: Chemours Chambers Works Manufacturing Facility
Category: None

Location
State / Country: NEW JERSEY
City: NEW JERSEY STATE AVERAGE

Location Modifier	Default	User	Reason for changes
	1.210	1.210	

Options
Database: Modified System Costs
Cost Database Date: 2016
Report Option: Fiscal

Description Cost Estimate for Remediation Action

Site Cost Summary Report
(with Markups)

Site:

ID: AOC16
Name: PFOA
Type: AOC

Media/Waste Type

Primary: Groundwater
Secondary: Structures and Equipment

Contaminant

Primary: Semi-Volatile Organic Compounds (SVOCs)
Secondary: Other

Phase Names

- **Pre-Study** ☐
- **Study** ☑
- **Design** ☑
- **Removal/Interim Action** ☑
- **Remedial Action** ☑
- **Operations & Maintenance** ☑
- **Long Term Monitoring** ☑
- **Site Closeout** ☑

Documentation

Description: PFOA made into AOC 16 for RACER cost estimating as more investigation and remediation needed post 2014-2016 Comprehensive RFI, due to USEPA and likely NJDEP lowering the safe drinking water standards for PFOA in 2016 and later. and more Point of Use Treatment required due to change in Groundwater standards. None of the existing AOCs 1-11 cover the area offsite, thus a new AOC that is contaminant specific is required to capture costs.

2016 mandated expanded PFOA investigation and monitoring. Remediation assumed to be expansion of existing PFOA point of use treatment of installation of GAC at residential wells affected by PFOA. Correspondence indicates that 250 wells known to be affected but with lowering of the drinking water standards, this may greatly increase number of affected wells. Original settlement was for up to 5,000 residents. Additional affected parties are being discovered per Sept/Oct 2016 analytical results including some whose levels were within acceptable standards before the safe drinking water standards were lowered. Standard monitoring of wells at Chamberworks including PFOA included in AOC 15 and thus not included here to avoid double-dipping. This AOC is for expanded investigation and treatment costs for offsite residents. If offsite area-wide treatment such as expanding pump and treat is contemplated, or residences beyond 2000 feet of the Chambers Works Manufacturing Facility is mandated, additional RACER costs may be needed.

In initial reports circa 2005-2007 regarding Chambers Works areas, IGW was indicated as the primary line of defense for PFOA. PFOA well network was sampled and reported on a semi-annual basis. Subsequent offsite sampling in residential areas in Carney's Point and in Pennsville indicated that PFOA was

Site Cost Summary Report
(with Markups)

outside the effective capture zone of the IGW and offsite investigations and residential well sampling commenced and was carried out over time. 2008-2010 groundwater investigations centered on offsite residential sampling within 2000 feet of the Chambers Works site to the south on far side of Salem Canal, north, northeast and east. Some theories were advanced that PFOA was being emitted in emissions at the site. Also, PFOA residues previously disposed of in the C-Landfill was discontinued and is now disposed of offsite. This raises the issue of whether the IGW is capable of capturing PFOA in groundwater. At the very least, it would seem that the IGW may need to operate for a significant length of time to prevent further migrations offsite. Subsequent work also has been requested by NJDEP and USEPA in 2016 to characterize the extent of PFOA to the west in sediiments and under the Delaware River. Baseline ecological studies may need to be extended to evaluate PFOA presence as previous work kept PFOA studies separate from conventional contaminant investigation/studies under the various investigations conducted for the Chamber Works site including for Carney's Point. PFOA presence in NAPL is being evaluated along the western AOC's and southern AOC's affecting the Salem Canal and the Delaware River. PFOA presence should also be evaluated in vapor intrusion studies although costs have not been included in this RACER analysis.

Support Team: The TBLS Group, LLC

References: 2015-2016 Comprehensive RFI, Aecom.
Assorted emails between USEPA, NJDEP and Chemours in 2016 regarding additional PFOA investigation and residential well sampling
Second Semester 2015 NPDES/DGW Report, 2016, AECOM
2014 PFOA Monitoring
2010 PFOA Groundwater Investigation Addendum II, URS
2009 PFOA Groundwater Addendum, URS.
2008 PFOA Groundwater Investigation Report, URS
April 2008 PFOA Monitoring Program Groundwater Results, URS.
2007 PFOA PA/SI, URS
2005 PAR for PFOA, URS
May 2014 PFOA Monitoring Program Groundwater Results, URS
URS. 2014. Comprehensive RCRA Facility Investigation Report. DuPont Chambers Works Complex, Deepwater, New Jersey.
September-October 2016 Chemours Residential Drinking Water Well Sampling Results for PFOA

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Estimate Prepared Date: 12/08/2016

Estimator Signature: _____ **Date:** 12/4/16

Reviewer Information

Reviewer Name: Paul Scian

Site Cost Summary Report
(with Markups)

Reviewer Title: Principal Analyst/Hydrogeologist
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Date Reviewed: 12/04/2016
Reviewer Signature: Paul Sc... **Date:** 4 Dec 2016

Site Cost Summary Report
(with Markups)

Phase	Direct Cost	Markups	Total Cost
Study	$1,047,127	$681,824	$1,728,951
Design	$100,699	$0	$100,699
Remedial Action	$1,000,000	$258,740	$1,258,740
Operations & Maintenance	$1,675,968	$1,408,513	$3,084,481
Site Closeout	$1,424,218	$1,477,218	$2,901,436
Total Site Cost	$5,248,012	$3,826,295	$9,074,307

EXHIBIT 17

Site Cost Summary Report
(with Markups)

System:

RACER Version: RACER® Version 11.3.18.0
Database Location: C:\Users\hhhoratio\Documents\RACER 11.3\RACER.mdb

Folder:

Folder Name: Meyner & Landis

Project:

ID: AM115
Name: Chemours Chambers Works Manufacturing Facility
Category: None

Location
State / Country: NEW JERSEY
City: NEW JERSEY STATE AVERAGE

Location Modifier	Default	User	Reason for changes
	1.210	1.210	

Options
Database: Modified System Costs
Cost Database Date: 2016
Report Option: Fiscal

Description Cost Estimate for Remediation Action

Site Cost Summary Report
(with Markups)

Site:

ID: AOC17
Name: Carney's Point
Type: AOC

Media/Waste Type

Primary: Soil
Secondary: Groundwater

Contaminant

Primary: Semi-Volatile Organic Compounds (SVOCs)
Secondary: None

Phase Names

Pre-Study ☐
Study ☑
Design ☑
Removal/Interim Action ☑
Remedial Action ☑
Operations & Maintenance ☑
Long Term Monitoring ☑
Site Closeout ☑

Documentation

Description: Carney Point made into AOC 17 for RACER cost estimating as more investigation and remediation needed post 2014-2016 Comprehensive RFI and cleanup/capping at old Nitro area and marsh restoration

From 2006 PAR: The Carneys Point [AOC] (also known as Carneys Point Works and Plant is approximately 758 acres located in the northernmost section of the Chambers Works Complex and borders the Delaware River to the west and Helms Cove to the north. Carneys Point is bordered to the east by Shell Road (Route 130) and to the south by the WWTP AOC and Dyes FAs. Carneys Point was the location of the former Carneys Point Works, which operated from 1892 to 1979 and produced nitrocellulose and smokeless gunpowder. the materials involved in production included ether, amines, plasticizers, nitrotoluenes, nitroglycerin salts, nitric acid and sulfuric acid. Off-quality nitrocellulose was the primary waste from the area. Carneys Point is the location of a wildlife habitat area, and the only activity currently associated with it is with the permitted C Landfill.

Two named waterways cross the Carneys Point FA: Bouttown Creek in the northern section and Henby Creek at the southern section, just north of the current WWTP). Bouttown Creek discharged to the north directly to the Delaware River via a sluice gate prior to 1974, and currently discharges into Henby Creek to the south. Henby Creek enters the Carneys Point FA at the east and discharges to the west into the Delaware River via a sluice gate. The SWMUs listed below are located within the Carneys Point [AOC]:

SWMU 13: Secure C Landfill

Site Cost Summary Report
(with Markups)

SWMU 19: Nitrocellulose Disposal Area
SWMU 37: Disposal Area
SWMU 42: Henby Creek
SWMUs 44 and 53: Surface Water Impoundment and Water Treatment Facility
SWMUs 45-1 through 45-8: Manufacturing Areas
SWMU 45-9: Former Process Drainage System
SWMU 46: Dredged Spoils Area
SWMU 47: Areas of Fill Deposition
SWMUs 48-1 through 48-7: Storage/Cleaning Areas
SWMU 49: Dewatering Pad
SWMU 52: Debris Disposal Area
SWMU 54: Solvent Recovery Units (Plant 2)
SWMU 60: Drum Disposal Area
SWMU 61: Disposal Area II

From the 2014 RFI, pg 44-54 and figs 2-2, 11-1, 11-2, 6-1, 6-2, 6-3, 6-4, 6-5, 6-6, 6-7, 6-8, 6-9, 6-10, 6-10, 6-11, 6-12:

From Table 6-1 of 2014 RFI:
Summary of Carneys Point SWMUs and Soil Data Status
SWMU: Description: RFI Status:Soil Data Set Status:Fact Sheet Soil Exceedances:Significant Deviation of Exceedances (criteria specified by SWMU) (Yes/No/Not Applicable)

SWMU 13: Cell 1 of the Secure "C" Landfill:NFA Approved,EPA Letter 2002 (but not by NJDEP) :No soil data collected.Groundwater data collected:Not applicable,Not applicable. (All other Cells are still active and being monitored.)

SWMU 19: Nitrocellulose Waste Disposal Area: NFA Approved EPA Letter 1993 (but not by NJDEP): Soil stabilized or removed; data not included in summary tables: Not applicable:Not applicable

SWMU 37: Carneys Point Manufacturing Disposal Area: NFA Approved EPA Letter 2002 (but not by NJDEP): Soil data included in SWMU 37 summary tables. : NJRDCSCC - None, No.

SWMU 42: Henby Creek: NFA Recommended in PAR 2006 and Summary of Carneys Point Ecological Investigations 2010: No soil data collected.: Not applicable: Not applicable

SWMU 44: Carneys Point Surface Impoundments: NFA Recommended in PAR 2006. no soil data collected. Not applicable
Not applicable

SWMU 45-1: Carneys Point Manufacturing Area 1: NFA Recommended in PAR 2006: Soil data not included in summary tables. Sample locations include B-45-1.1, B-45- 1.2, B-45-1.3 NJNRDCSCC - Slight exceedance of benzo(a)pyrene and arsenic, NJIGWSCC - None; No

SWMU 45-2: Carneys Point Manufacturing Area 2: CMS Recommended in 2013: Soil data included in SWMU 45-2 summary tables. Pre-2011 Investigations NJNRDCSCC - Arsenic, copper, lead, zinc, 5 PAHs and 2,4-DNT GWIIA - SPLP arsenic and lead Interior Investigation NJNRDCSRS - arsenic

Site Cost Summary Report
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and lead. No.

SWMU 45-3: Cameys Point Manufacturing Area 3: NFA Recommended in PAR 2006: Soil stabilized or removed; data not included in summary tables. Not applicable Not applicable

SWMU 45-4: Cameys Point Manufacturing Area 4: NFA Recommended in PAR 2006: Soil stabilized or removed; data not included in summary tables. Not applicable Not applicable

SWMU 45-5: Cameys Point Manufacturing Area 5: NFA Recommended in PAR 2006: Soil data not included in summary tables. Sample locations include B-45-5.1, B-45- 5.2, B-45-5. NJNRDCSCC - Slight exceedance of arsenic, NJIGWSCC-None. No.

SWMU 45-6: Cameys Point Manufacturing Area 6: NFA Recommended in P3RFI 2002 and in PAR 2006. Soil data included in SWMU 45-6 summary tables: NJRDCSCC – None, NJNRDCSCC - None, NJIGWSCC - None, No.

SWMU 45-7: Cameys Point Manufacturing Area 7: NFA Recommended in P3RFI 2002 and PAR 2006. Soil data included in SWMU 45-7 summary tables: NJRDCSCC –None. NJNRDCSCC – None. NJIGWSCC - None. No.

SWMU 45-8: Cameys Point Manufacturing Area 8: NFA Recommended in PAR 2006. Soil stabilized or removed; data not included in summary tables. Not applicable. Not applicable

SWMU 45-9: Cameys Point Manufacturing Area 9: NFA Recommended in PAR 2006. Soil stabilized or removed; data not included in summary tables. Not applicable. Not applicable.

SWMU 46: Dredge Spoils Area: NFA Approved EPA Letter 2002 (but not by NJDEP). Soil not included in summary tables. Sample locations include B-1, B-2, B-3, B-4, B-5: NJNRDCSCC - None No.

SWMU 47: Cameys Point Area of Fill Deposition.: NFA Approved EPA Letter 2002 (but not by NJDEP). Soil data included in SWMU 47 summary tables. NJNRDCSCC - Slight exceedance of arsenic. No.

SWMU 48-1 Cameys Point Drum Storage/Cleaning Area 1: NFA Recommended in P3RFI 2002.: Soil data included in SWMU 48-1 summary tables: NJNRDCSCC - Slight exceedance of arsenic. No

SWMU 48-2 Cameys Point Drum Storage/Cleaning Area 2: NFA Recommended in P4RFI 2006. Soil was stabilized or removed; data not included in summary tables; samples outside of remediated area included in SWMU 48-2 summary tables: NJNRDCSCC – None, NJIGWSCC – None· No.

SWMU 48-3 Cameys Point Drum Storage/Cleaning Area 3: NFA Recommended in P3RFI 2002 and BEE 2006.: Soil data included in SWMU 48-3 summary tables.: NJRDCSCC – None, NJNRDCSCC - None, NJIGWSCC - None: No

SWMU 48-4 Cameys Point Drum Storage/Cleaning Area 4: NFA Approved EPA

Site Cost Summary Report (with Markups)

Letter 1993 (but not NJDEP) : Soil stabilized or removed; data not included in summary tables. Not applicable. Not applicable.

SWMU 48-5 Carneys Point Drum Storage/Cleaning Area 5: NFA Recommended in P3RFI 2002 and in BEE 2006.
Soil data included in SWMU 48-5 summary tables. NJRDCSCC – None. NJNRDCSCC - None. NJIGWSCC - None. No.

SWMU 48-6 Carneys Point Drum Storage/Cleaning Area 6: NFA Recommended in P3RFI 2002 and in BEE 2006.: Soil data included in SWMU 48-6 summary tables. NJRDCSCC – None. NJNRDCSCC - None. NJIGWSCC - None.: No.

SWMU 48-7: Carneys Point Drum Storage/Cleaning Area 7.: NFA Recommended in P3RFI 2002 and in BEE 2006 Soil data included in SWMU 48-7 summary tables. NJRDCSCC – None. NJNRDCSCC - None. NJIGWSCC - None. : No

SWMU 49: Dewatering Pad: NFA Approved by EPA Letter1993 (NJDEP?).: Soil data not included in summary tables. Sample locations include B49-1, B49-A, B49-B, B49-5 NJNRDCSCC - Slight exceedance of benzo(k)fluoranthene and dibenzo(a,h) anthracene. NJIGWSCC - None: No.

SWMU 52: Debris Disposal Area.: NFA Recommended in SWMU 52 ISM RAR 2007.: Soil was stabilized or removed; data not included in summary tables; samples outside of remediated area included in SWMU 52 summary tables.: NJNRDCSCC - Slight exceedance of lead.: No.

SWMU 53: Carneys Point Water Treatment Facility: NFA Recommended in PAR 2006. Determined not to be SWMU; no soil data collected.: Not applicable Not applicable.

SWMU 54: Solvent Recovery Units: NFA Approved in EPA Letter 2002 (NJDEP?).: Soil data included in SWMU 54 summary tables. NJRDCSCC-None. No.

SWMU 61: Carneys Point Disposal Area 2: NFA Approved in EPA Letter 2002 (NJDEP?): Soil data included in SWMU 61 summary tables. NJNRDCSCC - Arsenic and lead. : No.

From the 2014 Comprehensive RFI by URS:
"Figures were developed to demonstrate the locations where detected constituents exceeded NJGWIIA. The constituent with the maximum exceedance factor (maximum detected concentration divided by the criterion) is shown at each location. Figures 6-4 through 6-11 indicate locations with exceedances for the B and C aquifers for VOCs, SVOCs, metals (total), and pesticides/PCBs. Because exceedances shown in the area south of Henby Creek are more likely related to past practices in the manufacturing area, the area south of Henby Creek is discussed in Section 7 as part of the manufacturing area groundwater discussion. Figures were not developed for the D and E aquifers because there was a limited number of detections and exceedances for these aquifers and these exceedances are primarily related to the manufacturing area (and are considered in Section 7). Otherwise, in general, the primary impacts to B and C aquifer groundwater are metals; specifically, the metals that most frequently exceeded GWIIA to the highest degree are arsenic

Site Cost Summary Report
(with Markups)

and lead. The following text provides a summary of exceedances by specific area and aquifer with an emphasis on constituents that are indicated on the figures:

Perimeter along Delaware River (including SWMU 45-2 area):
B aquifer. Limited locations of VOC and SVOC exceedances including tetrachloroethene (PCE) and bis(2-ethylhexyl)phthalate. Metal exceedances include arsenic and lead.
C aquifer. Limited locations of VOC and SVOC exceedances including 1,2-dichloroethane (DCA), n-nitrosodimethylamine, and bis(2-ethylhexyl)phthalate. Metal exceedances include iron and manganese.

Perimeter along north and east property boundary:
B aquifer. No VOC or SVOC exceedances. Metal exceedances include aluminum and lead.
C aquifer. Limited locations of VOC exceedances including PCE. No SVOC exceedances. Metal exceedances include iron.

C Landfill area:
B aquifer. Limited locations of VOC and SVOC exceedances including benzene and aniline. Metal exceedances include aluminum, iron, and manganese.
C aquifer: no sampling or monitoring.

Other interior areas (related to sampling for SWMUs and monitoring)
B aquifer. Limited locations of VOC and SVOC exceedances including TCE, benzo(a)anthracene, and bis(2-ethylhexyl) phthalate. Metal exceedances include aluminum, antimony, cadmium, chromium, iron, and manganese.
C aquifer. Limited locations of VOC and SVOC exceedances including methylene chloride. Metal exceedances include iron.+

"6.3 Carneys Point Surface-Water, Sediment/Hydric Soil, and Sediment Interstitial Water
Surface-water, sediment/hydric soil, and sediment interstitial water sampling were performed as part of the RFI program and follow-on investigations that specifically evaluated constituents of potential ecological concern (COPECs). The reports, Summary of Ecological Investigations in Carneys Point (URS, 2010b) and Ecological Investigation Report (DuPont CRG, 2009), provide a comprehensive account of the historical and more recent investigations of on-site surface water, sediment/hydric soil, and sediment interstitial water, as well as the ecological risk evaluations and conclusions. This section presents a summary of the results and identifies COPECs...."Surface-water and/or sediment/hydric soil samples were collected from the following features in Carneys Point: Bouttown Creek, Henby Creek (SWMU 42), Helms Basin, Bouttown Creek Wetlands, Henby Creek Wetlands, A Pond, E Pond, Historical B Pond, and Historical E Pond at specific locations shown in Figure 6-12 (DuPont CRG, 2006a; DuPont CRG, 2009; URS, 2010b). In addition, sediment interstitial water sampling was conducted in Bouttown Creek, Henby Creek, and the Bouttown Creek Wetlands (see Figure 6-12). Sampling areas and locations were based on an evaluation in the site-wide BEE (DuPont CRG, 2006b) of the co-occurrence of COPECs, environmentally sensitive natural resources (ESNRs) and potential migration pathways from the site to ESNRs. Potential migration pathways included historical process discharges, stormwater runoff, and a potential groundwater to surface-water connection from the B aquifer to surfacewater bodies. For the Ecological Investigation conducted during 2007

Site Cost Summary Report
(with Markups)

through 2008, historical sediment, surface-water, soil, and groundwater data were compared to ecological screening criteria (DuPont CRG, 2009). Constituents with concentrations in historical datasets exceeding ecological screening criteria in any medium were identified as preliminary COPECs and included the following:

Semi-Volatile Organic Compounds:
2,4-dinitrotoluene
bis(2-ethylhexyl)phthalate
N-nitrosodiphenylamine
Nitroaromatics/Nitroamines: Nitrocellulose

Polycyclic Aromatic Hydrocarbons (PAHs):
Acenaphthene
Acenaphthylene
Anthracene
Chrysene
Fluoranthene
Fluorene
Naphthalene
Phenanthrene
Pyrene Benzo(k)fluoranthene
Benzo(b)fluoranthene
Benzo(a)pyrene Benzo(a)anthracene
Benzo(g,h,i)perylene
Dibenz(a,h)anthracene Indeno(1,2,3-cd)pyrene

Metals:
Antimony
Arsenic
Cadmium
Chromium
Copper
Lead
Mercury
Nickel
Selenium
Silver
Vanadium
Zinc

URS Conclusions: "Based on the information provided in this RFI report text, tables, and figures and supported by more detailed information in the fact sheets and referenced documents, the RFI for Carneys Point is complete. All of the Carneys Point SWMUs have been fully investigated, the nature and extent of their impacts have been characterized, remediation has been performed as recommended, and RFI recommendations have been substantiated. Groundwater is evaluated on a site-wide basis. For the Carneys Point area, the impacts to groundwater have been characterized. Groundwater at the site is part of the site-wide CEA and not used for any purpose. Containment systems will continue to operate, and groundwater will continue to be monitored per the site-wide monitoring programs that are in-place. The containment and monitoring programs will continue to be documented in the semi-annual DGW reports."

Site Cost Summary Report
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Despite these conclusions, in 2016, investigations continue to occur in various SWMUs and other areas of interest in Carneys Point area based on the results above despite URS efforts to indicate that NFA conditions are present or agreed to by the various regulatory agencies. These include the T-29 PCB area, the Carney's Point Manufacturing Area, C Landfill, as well as various other areas of Carney's Point. PFOA is also monitored at the boundaries of Carneys Point, but a detaiiled investigation has yet to be carried out and ecological studies have yet to be amended in Carneys Point AOC for PFOAs. DNAPL investigations along the southern fringe of Carneys Point may be a data gap as well as the delineation shown in the 2014 RFI is shown as nearly straight line which seems idealized. Nonetheless, these were not costed for in the RACER analysis for Carneys Point as this does not seem to be a focus currently by regulators.

Support Team: The TBLS Group, LLC

References:

CRG. 2006. Preliminary Assessment Report. DuPont Chambers Works Complex, Deepwater, New Jersey.
CRG, 2006, Revised Baseline Ecological Evaluation, Sept 2006.
CRG. 2005, Phase IV RCRA Facility Investigation Report. Pages 11-18,
URS. 2011. Carneys Point Redevelopment Area Phase I ESA, DuPont Chambers Works. Deepwater, New Jersey, August 2011
URS. 2011. Carneys Point Redevelopment Area Phase II ESA. DuPont Chambers Works, Deepwater, NJ December 2011.
URS. 2010. Summary of Ecological Investigations in Carneys Point. DuPont Chambers Works, Deepwater, NJ, May 2010.
URS. 2010. Perimiter Investigation Report. DuPont Chambers Works, Deepwater, NJ, 2010
URS. 2013, SWMU 45-2 Investigation Summary Report, Carneys Point Redevelopment Area, Carneys Point, NJ, May 2013.
URS. 2012. T29 Area Polychlorinated Biphenyls, (PCBs) Removal Summary Report, DuPont Chambers Works, Deepwater, NJ. January 2012.
URS. 2010. Henby Creek Mitigation Area, 2009 final Mitigation Monitoring Report, DuPont, Chambers Works, Deepwater, NJ, Feb 2010.
URS. 2014. Comprehensive RCRA Facility Investigation Report. DuPont Chambers Works Complex, Deepwater, New Jersey.

Estimator Information

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Estimator Title: EVP
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Estimate Prepared Date: 12/03/2016
Estimator Signature: _____ **Date:** 12/4/2016

Reviewer Information

Reviewer Name: Paul Scian
Reviewer Title: Principal Analyst/Hydrogeologist
Agency/Org./Office: The TBLS Group LLC
Business Address: 25 South Road
Telephone Number: (973) 750-1500, ext 2

Site Cost Summary Report
(with Markups)

Email Address: pauls@thetblsgroup.com
Date Reviewed: 12/04/2016
Reviewer Signature:  **Date:** 4 Dec 2016

Site Cost Summary Report
(with Markups)

Phase	Direct Cost	Markups	Total Cost
Design	$455,161	$0	$455,161
Remedial Action	$4,339,207	$2,163,095	$6,502,302
Operations & Maintenance	$961,655	$479,385	$1,441,040
Site Closeout	$11,955,592	$6,531,461	$18,487,053
Total Site Cost	$17,711,616	$9,173,941	$26,885,557

EXHIBIT 18

Site Cost Summary Report (with Markups)

System:

RACER Version: RACER® Version 11.3.18.0
Database Location: C:\Users\hhhoratio\Documents\RACER 11.3\RACER.mdb

Folder:

Folder Name: Meyner & Landis

Project:

ID: AM115
Name: Chemours Chambers Works Manufacturing Facility
Category: None

Location
State / Country: NEW JERSEY
City: NEW JERSEY STATE AVERAGE

Location Modifier	Default	User	Reason for changes
	1.210	1.210	

Options
Database: Modified System Costs
Cost Database Date: 2016
Report Option: Fiscal

Description Cost Estimate for Remediation Action

Site Cost Summary Report (with Markups)

Site:

ID: AOC18
Name: Delaware River
Type: AOC

Media/Waste Type

Primary: Free Product
Secondary: Free Product

Contaminant

Primary: Multi-Contaminant
Secondary: Semi-Volatile Organic Compounds (SVOCs)

Phase Names

- **Pre-Study** ☐
- **Study** ☑
- **Design** ☑
- **Removal/Interim Action** ☐
- **Remedial Action** ☑
- **Operations & Maintenance** ☑
- **Long Term Monitoring** ☑
- **Site Closeout** ☑

Documentation

Description: Delaware River made into AOC 18 for RACER cost estimating as more investigation and remediation needed post 2010 Perimeter Investigation, 2013 Interior Investigation, and 2014-2016 Comprehensive RFI and NJDEP/EPA correspondence including sediment investigation and remediation offshore of AOC 1, 2, 3 as well as NAPL removal subsurface beneath Delaware River in Aquifer B.

In 1999, CRG first reported that the IWS system might not have complete hydraulic control to the west and north such that potential escaping contaminants might be occurring from the Chambers Works Site, i.e. "...These three areas are where the interceptor well system may not be completely containing B Aquifer groundwater. The three areas (AOCs), Antiknocks, Fluoroproducts, and northern Carneys Point." A mass balance was calculated to indicate that they believed that any discharge was still within their NJPDES permit limits. In the mass balance calculation they indicate that the gradient was less than 1% which later has been used to indicate incomplete capture. A wide variety of VOCs, SVOCs, metals, and inorganics were theorized based on discharge estimates to be escaping containment in the B-Aquifer. Subsequently following a letter to investigate from the regulators in 2004, a work plan and investigation was initiated in 2005 to prove that discharges were insignificant: "evaluating the groundwater (GW) to surfacewater (SW) interface in the Delaware River adjacent to DuPont Chambers Works in Deepwater, New Jersey. This groundwater to surface-water interface includes the B Aquifer subcrop zone beneath the river and the seawall (which separates the A zone from the river). The majority of the A zone is physically separated from the Delaware River by a bulk head / seawall along the Chambers Works facility and

Site Cost Summary Report
(with Markups)

it generally consists of fill material on top of the pre-development ground surface. The B Aquifer is in direct contact with the Delaware River and is heavily influenced by tidal fluctuations in the Delaware River. The A zone groundwater in the vicinity of the Delaware River is essentially dammed behind the existing seawall structure. From 1999 to 2004, investigations indicated that the mean Delaware River elevations appeared to be lower than many of the B Aquifer head elevations, suggesting that there is a potential for groundwater flow offsite to the Delaware River.

The 2008 investigationindicated that the subcrop area of the upper B Aquifer at the southern part of the complex is approximately 250 to 300 feet offshore and the lower B Aquifer (beneath the intermediate B Clay) subcrops approximately 600 to 700 feet offshore. Results from sampling west of Jackson Labs AOC indicated that contaminants above the GWIIA criteria were present in the B Aquifer 90 feet west of the sea wall including 1,1-Dichloroethene (DCE), Chlorobenzene, Vinyl Chloride (VC), 1,2-Dichlorobenzene (DCB), Chloroform, 1,2,4-Trichlorobenzene (TCB), 1,4-DCB, cis-1,2-DCE, 4-Chloroaniline, Benzene, Tetrachloroethylene (PCE), Aniline, Carbon Tetrachloride, Trichloroethene (TCE), Hexachlorobutadiene, Total dissolved solids, (TDS), Metals/Conventionals: aluminum, antimony, arsenic, beryllium, cadmium, chromium, copper, iron, lead, manganese, mercury, nickel, silver, sodium, thallium, zinc, chloride. Site-specific constituents were present at concentrations greater than WIIA criteria at all 14 offshore groundwater sampling locations to varying degree;concentrations generally decrease with distance from the sea wall, and the highest concentrations were detected offshore of the south Fluoroproducts area, where an oily liquid was detected at one location. The source(s), spatial extent, and fate and transport processes associated with the liquid are unknown. Although, impact to sediments and groundwater beneath the Delaware River were evident at west of AOC 1, 2, and 3 (and are suspected west of the Carneys Point AOC), subsequent investigations concentrated on investigation of the NAPL found west of AOC 1, the Fluoroproducts AOC.

The 2011 Delaware River Remedial Investigation found that elevated concentrations of site-related constituents are spatially focused near the shore adjacent to the Fluoroproducts Area and Jackson Labs/TEL Area. Site-related volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs) were the primary constituents of potential ecological concern (COPECs) in sediments. The greatest concentrations of site-related VOCs and SVOCs measured in sediments were associated with samples collected in the nearshore area adjacent to the Fluoroproducts Area; elevated concentrations of site-related VOCs and SVOCs were also measured in sediment samples collected near the shore adjacent to Jackson Labs/TEL Area. Evaluation of VOC and SVOC concentrations in groundwater samples collected adjacent to areas of elevated sediment concentrations indicates potential groundwater to sediment migration pathways. Site-related VOCs were detected in surface water samples collected near the shore adjacent to the Fluoroproducts Area and Jackson Labs/TEL Area. Sampling along Carneys Point (in the SWMU-5/Henby Creek area) also indicated maximum exceedances for SVOCs, VOCs, metals and PAHs, in the low ppm range, but less than further south which were in the moderate to high ppm range.

In Sept 2015, NJDEP/USEPA requested a more complete characterization of offsite DNAPL under Delaware River/in sediments west of AOC 1 indicating that work to-date was not adequate for full characterization. This was followed up with a second request in January 2016 also asking for a full suite of PFOA

Site Cost Summary Report
(with Markups)

sampling as part of the Delaware River investigation. In February 2016 a NAPL delineation including PFOA sampling plan for the Delaware River was submitted by AECOM. The investigation has not yet been completed.

It is anticipated, based on current status, although no remediation design is in place that both a sediment cleanup and a DNAPL cleanup below the Delaware River in the B-Aquifer will be required. For the RACER estimate both a remediation of source DNAPL beneather the river in the B-Aquifer as has been indicated will occur using the standard treatment train, as well as a sediment cleanup consisting of dredging and capping.

Support Team: The TBLS Group, LLC

References: AECOM, Delaware River NAPL Delineation Sampling Plan, February 2016.
Geosyntec, DuPont Chambers Works Remedial Action Screening Report, 2012.
URS. August 2010. "Perimeter Investigaiton Report, DuPont Chambers Works, Deepwater, NJ.
URS. 2014. Comprehensive RCRA Facility Investigation Report. DuPont Chambers Works Complex, Deepwater, New Jersey.
GeoCleanse, ISCR Manganese-Mediated Peroxide Bench Test Results, 2013
GeoCleanse, AOC 1 Draft Pilot Test Work Plan, DuPont Chambers Works, 2014
Assorted emails between USEPA, NJDEP and Chemours in 2014-2016 correspondence regarding additional investigation of Delaware River sediments and aquifers underlying the Delaware River west of AOCs 1-3.
Second Semester 2015 NPDES/DGW Report, 2016, AECOM
CRG, Technical Memorandum Potential B Aquifer Mass Loadings to Delaware River, DuPont Chambers Works, New Jersey, 1999.
CRG, Delaware River Groundwater to Surface-Water Investigation Work Plan, Chambers Works Deepwater, New Jersey, 2005, 2006
2008, CRG, Delaware River Groundwater to Surface-Water Investigation Report, DuPont Chambers Works Complex, Deepwater, New Jersey, 2008.
2010 Perimeter Investigation Report, URS.
2011 Delaware River Remedial Investigation Report, DuPont Chambers Works Site, Deepwater, New Jersey, URS
2013 RCRA Facility Investigation Data Gap Sampling Plan. URS
2013 Interior Investigation Technical Memorandum, URS
2014 Comprehensive RCRA Facility Investigation Report, URS
2014-2016 NJDEP, DuPont, USEPA email correspondence concerning additional sediment, DNAPL, PFOA, in/under Delaware River.

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Email Address: jeffa@thetblsgroup.com
Estimate Prepared Date: 12/05/2016
Estimator Signature: _____ **Date:** 12/5/2016

Reviewer Information

Reviewer Name: Paul Scian

Site Cost Summary Report
(with Markups)

Reviewer Title: Principal Analyst/Hydrogeologist
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Telephone Number: (973) 750-1500, ext 2
Email Address: pauls@thetblsgroup.com
Date Reviewed: 12/05/2016
Reviewer Signature: Paul Sacks **Date:** 5 Dec 2016

Site Cost Summary Report
(with Markups)

Phase	Direct Cost	Markups	Total Cost
Study	$1,654,314	$1,976,010	$3,630,325
Design	$998,488	$0	$998,488
Remedial Action	$19,201,451	$7,084,292	$26,285,743
Long Term Monitoring	$464,044	$238,791	$702,835
Total Site Cost	$22,318,297	$9,299,092	$31,617,390

EXHIBIT 19

Site Cost Summary Report (with Markups)

System:

RACER Version: RACER® Version 11.3.18.0
Database Location: C:\Users\hhhoratio\Documents\RACER 11.3\RACER.mdb

Folder:

Folder Name: Meyner & Landis

Project:

ID: AM115
Name: Chemours Chambers Works Manufacturing Facility
Category: None

Location
State / Country: NEW JERSEY
City: NEW JERSEY STATE AVERAGE

Location Modifier	Default	User	Reason for changes
	1.210	1.210	

Options
Database: Modified System Costs
Cost Database Date: 2016
Report Option: Fiscal

Description Cost Estimate for Remediation Action

Site Cost Summary Report
(with Markups)

Site:

ID: AOC19
Name: Salem Canal
Type: AOC

Media/Waste Type

Primary: Free Product
Secondary: Soil

Contaminant

Primary: Semi-Volatile Organic Compounds (SVOCs)
Secondary: Volatile Organic Compounds (VOCs)

Phase Names

- **Pre-Study** ☐
- **Study** ☑
- **Design** ☑
- **Removal/Interim Action** ☑
- **Remedial Action** ☑
- **Operations & Maintenance** ☑
- **Long Term Monitoring** ☑
- **Site Closeout** ☑

Documentation

Description: The Salem Canal is a freshwater, manmade canal that is approximately 7 ,000 feet long and 200 feet wide. The Salem Canal was hand-excavated in 1872 to connect the tidal Salem Creek with the Delaware River and to allow commercial barge traffic from in-land agricultural areas to markets along the river. The Salem Canal was originally dug to a depth of between 12 and 14 feet below ground surface to an estimated elevation of -6 feet North American Vertical Datum (NAVD 88). In 1933, DuPont acquired approximately 1,000 acres of property and riparian rights along a 12-mile stretch of the Salem Canal and Salem Creek for the purpose of creating a reservoir to supply fresh water (potable) to the Chambers Works facility. The Munson Dam was constructed in 1933, isolating the freshwater of the canal from the brackish tidal water of the Delaware River. A freshwater intake structure was constructed at the dam allowing DuPont to withdraw water for plant use. Sedimentation of the Salem Canal has been occurring since the completion of the Munson Dam. The plant intake withdraws an average of 9.5 million gallons a day from the canal for plant use. Excess water is released into the Delaware River at low tide using a manual floodgates at Munson Dam.

To address potential migration of DNAPL in the B Aquifer identified in the Phase II RFI DuPont conducted a groundwater study in late 1998 and 1999. Five monitoring wells were installed and groundwater evaluation was conducted to determine potential lateral migration of NAPL in the B Aquifer in the Salem Canal area. Further work was necessary. In the Phase IV RFI, high dissolved concentrations of aniline, chlorobenzene, and dichlorobenzene were present and depicted under the Salem Canal in iso-concentration contour plots for the adjacent SWMU-63.

Site Cost Summary Report
(with Markups)

Salem Canal Seep: During an atmospheric drought in August 2002, a seep was observed discharging from the north bank of the canal adjacent to the former Azo dye (SWMU 63) manufacturing area of the site. Since the initial observation, seep, groundwater, sediment, and surface water in the canal near the observed seep area have been sampled and analyzed to chemically characterize the purple colored seep material and to define the extent of material impacted in the canal. An initial Technical Memorandum summarizing the status of DuPont activities, understandings, and proposed additional investigative activities was submitted the NJDEP and USEPA on June 11, 2003. In early 2004, a Salem Canal work plan was submitted and approved by the NJDEP concerning surface-water and sediment delineation activities within the boom. Additional delineation activities regarding sediments, surface water and groundwater were completed in late 2004 for the area just outside of the boom.

2007-2013 Additional investigations of Salem Canal culminating in installation of sheetpile cut-off wall in 2013 along south side of Chambers Works Manufacturing site. In the summer of 2002, magenta-colored water was found seeping into the surface water along the north bank of the canal and subsequent field investigations from 2002 through 2007 were completed to delineate the impacted area. The primary constituents of potential concern (COPCs) in groundwater and sediment were chlorobenzene, dichlorobenzene, aniline, 4-chloroaniline, N-nitrosodiphenylamine, and benzene. These constituents are related to a subsurface dense non-aqueous phase liquid (DNAPL) source area, which is located north and upland of the canal within the former Azo dyes manufacturing area. A sheet-pile barrier (SPB) was installed in December 2008 along the northern bank of the canal as an Interim Remedial Action (IRA) to prevent the migration of impacted groundwater into and underneath the canal. The effectiveness of the SPB was evaluated with water-level data collected over a three-year period after installation. Analyses indicated that the SPB is achieving its design purpose to redirect groundwater flow and prevent impacted groundwater migration to the canal surface water and sediment and downgradient groundwater.

In the 2014 Comp RFI, PFOA was found on the south side of the Salem Canal (Figure 7-22). Fig 7-28 depicts DNAPL source area present up to the the Salem Canal. Baseline Ecological as reported in the 2014 RCRA Facility Investigation. Costs for remediation user derived based on literature literature search cost values for dredge and cap. B-Aquifer DNAPL/Seep cleanup assuming pathway complete as evidenced by PFOA on south side of Salem Canal.

Salem Canal made into AOC 19 for RACER cost estimating as more investigation and remediation needed post 2014-2016 Comprehensive RFI and NJDEP/EPA correspondence including sediment investigation and remediation as well as NAPL removal subsurface beneath Salem Canal in Aquifer B. Currently does not show presence, but additional work ongoing and costs included based on interim status. Salem Canal "AOC" referenced in Chemours meeting notes dated 8/27/2015 and regulators discuss that the Canal as a whole, other potential AOCs within the Salem Canal, and various contaminants might all be separated into AOCs within the Salem Canal.

Support Team: The TBLS Group, LLC

References:
CRG, Phase II RFI Report, DuPont Chambers Works, 1999
CRG, Phase IV RFI Report, DuPont Chambers Works, 2005
DuPont CRG. 2008. Salem Canal Sediment Supplemental Pre-Design Investigation Work Plan. DuPont Chambers Works, 2008.

Site Cost Summary Report
(with Markups)

DuPont CRG. 2007a. Salem Canal Pre-Design Investigation Report. DuPont Chambers Works, December 2007.
DuPont CRG. 2007b. Salem Canal Interim Remedial Action Work Plan. DuPont Chambers Works, December 2007.
DuPont CRG. 2005a. Salem Canal Pre-Design Investigation Work Plan. DuPont Chambers Works, November 2005.
DuPont CRG. 2005b. Phase IV RCRA Facility Investigation Report. DuPont Chambers Works. April 2005.
DuPont CRG. 2005c. Salem Canal Interim Remedial Measure Selection Report. DuPont Chambers Works, June 2005.
DuPont CRG. 2005d. Quality Assurance Project Plan with Sampling and Analysis Plan for Groundwater and Leachate Monitoring. DuPont Chambers Works, August 2005.
DuPont CRG. 2003. Salem Canal Seep Technical Memorandum. DuPont Chambers Works, June 11, 2003.
EPA and NJDEP. 2008. April 16, 2008 Approval and Comments on the Salem Canal Interim Remedial Action Work Plan. DuPont Chambers Works, D. EPA ID: NJD-002385730.
URS. 2003. Salem Canal Seep – Risk Evaluation Technical Memorandum 1, 2, 3.
CRG, Phase IV RFI Supplemental Report, 2007
URS, 2010 Perimeter Investigation
URS. July 2013. Salem Canal Groundwater Remedial Action Progress and Sediment Investigation Status Report
URS, June 2013. Salem Canal Interim Remedial Action Monitoring Report, DuPont Chambers Works Complex,
URS, July 2011. Salem Canal Interim Remedial Action Monitoring Sampling and Analysis Plan. DuPont Chambers Works Complex, Deepwater, New Jersey.
URS, July 2009. Salem Canal Interim Remedial Action Report – Sheet-Pile Barrier
(SPB), DuPont Chambers Works Complex, Deepwater, New Jersey.
2016 Salem Canal B-Aquifer Investigation, AECOM.
2014 RCRA Comprehensive Facility Investigation, AECOM.
Assorted emails between USEPA, NJDEP and Chemours in 2014-2016 regarding additional Salem Canal investigations, remediation
Second Semester 2015 NPDES/DGW Report, 2016, AECOM

Estimator Information

Estimator Name: Jeffrey Andrilenas
Estimator Title: EVP
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Business Address: 25 South Road
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Email Address: jeffa@thetblsgroup.com
Estimate Prepared Date: 12/06/2016
Estimator Signature: _____ **Date:** 12/6/16

Reviewer Information

Reviewer Name: Paul Scian
Reviewer Title: Principal Analyst/Hydrogeologist
Agency/Org./Office: The TBLS Group LLC

Site Cost Summary Report
(with Markups)

Business Address: 25 South Road
Telephone Number: (973) 750-1500, ext 2
Email Address: pauls@thetblsgroup.com
Date Reviewed: 12/06/2016

Reviewer Signature: Paul Sautter **Date:** 6 Dec 2016

Site Cost Summary Report
(with Markups)

Phase	Direct Cost	Markups	Total Cost
Study	$964,441	$621,775	$1,586,216
Design	$679,367	$0	$679,367
Remedial Action	$4,033,433	$1,637,048	$5,670,480
Operations & Maintenance	$236,570	$216,959	$453,529
Long Term Monitoring	$472,639	$590,516	$1,063,155
Total Site Cost	$6,386,449	$3,066,298	$9,452,747

EXHIBIT 20

Site Cost Summary Report
(with Markups)

System:

RACER Version: RACER® Version 11.3.18.0
Database Location: C:\Users\hhhoratio\Documents\RACER 11.3\RACER.mdb

Folder:

Folder Name: Meyner & Landis

Project:

ID: AM115
Name: Chemours Chambers Works Manufacturing Facility
Category: None

Location
State / Country: NEW JERSEY
City: NEW JERSEY STATE AVERAGE

Location Modifier	Default	User	Reason for changes
	1.210	1.210	

Options
Database: Modified System Costs
Cost Database Date: 2016
Report Option: Fiscal

Description Cost Estimate for Remediation Action

Site Cost Summary Report
(with Markups)

Site:

ID: AOC20
Name: Vapor Intrusion
Type: AOC

Media/Waste Type

Primary: Soil
Secondary: Structures and Equipment

Contaminant

Primary: Volatile Organic Compounds (VOCs)
Secondary: Semi-Volatile Organic Compounds (SVOCs)

Phase Names

- **Pre-Study** ☐
- **Study** ☑
- **Design** ☑
- **Removal/Interim Action** ☐
- **Remedial Action** ☑
- **Operations & Maintenance** ☑
- **Long Term Monitoring** ☑
- **Site Closeout** ☑

Documentation

Description: Currently, over 135 potentially occupied structures have been identified in the Chambers Works manufacturing area. These include both continuously and intermittently occupied structures.

Fifteen structures were sampled during the initial phase of the VI investigation conducted in April/May 2014. Buildings sampled were located in seven areas of concern (AOCs) (AOCs 1 through 6 and 9). These 15 structures primarily represent confirmed, continuously occupied structures located within the extent of dense non-aqueous phase liquid (DNAPL) source zones identified at the site or are located where occupational-based groundwater VI screening levels have been exceeded. During the VI investigation, constituents detected above generic New Jersey Non-Residential Soil Gas Screening Levels (NJNRSGSLs) included 1,2-dichloroethane (DCA), 1,4-dichlorobenzene (DCB), benzene, bromodichloromethane, carbon tetrachloride, chlorobenzene, chloroform, ethylbenzene, tetrachloroethylene (PCE), trichloroethene (TCE), and vinyl chloride (see Table 4-8 in URS, 2014a).

Confirmatory sub-slab sampling combined with indoor/ambient air sampling was then conducted in May 2015 for the 12 buildings where exceedances of New Jersey Non-Residential Soil Gas Screening Levels (NJNRSGSLs) were identified during the April 2014 investigation. Follow-up indoor air sampling conducted Exceedances were observed in 12 buildings investigated in AOCs 1, 3, 5, and 6: buildings 857, K-21, K-24, K-29, K-37, 603, 667, J-27, J-30, 84, 85, and 604. in July 2015 has determined that a Vapor Concern (VC) exists in one building (Building J-27) located within area of concern (AOC) 1 in the Jackson Labs portion of the site.

Site Cost Summary Report
(with Markups)

Vapor Intrusion made into AOC 20 for RACER cost estimating as more investigation and vapor abatement needed post 2014-2016 Comprehensive RFI and NJDEP/EPA correspondence including up to 60 building investigations a year for 2 years per Chemours as well as potential VI abatement, monitoring, and O&M. Widespread NAPL occurrence across all AOCs in Chamber Works Complex will require all buildings to be tested. Abatement was required on one of 15 buildings. The same ratio was used to predict costs over the remaining 120 buildings to be tested. Costs expected to be short term as the source area remediations will diminish VI concerns.

Support Team: The TBLS Group LLC

References:

DuPont CRG. 2006. Preliminary Assessment Report. Chambers Works Complex, December 2006.
DuPont CRG. 2004. Phase IV RCRA Facility Investigation Report. DuPont Chambers Works, April, 2004
URS, Vapor Intrusion Remedial Investigation Work Plan. DuPont Chambers Works, 2014
URS. 2014a. Comprehensive RFI Report. DuPont Chambers Works Complex, October 2014.
URS. 2014b. Vapor Intrusion Remedial Investigation Work Plan. DuPont Chambers Works Complex, February 2014.
URS. 2013a. Chambers Works HASP Addendum 8 – Vapor Intrusion Sampling. DuPont Chambers Works Complex,
NJDEP 2013b. Vapor Intrusion Guidance. NJDEP, January 2013.
AECOM, Vapor Intrusion Technical Memorandum, Phase II, February 2015
AECOM, Chambers Works Vapor Concern Mitigation Plan. August 2015
NJDEP, USEPA, DuPont correspondence, emails, etc 2013-2016.

Estimator Information

Estimator Name: Jeffrey Andrilenas
Estimator Title: EVP
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Business Address: 25 South Road
Telephone Number: (973) 750-1500
Email Address: jeffa@thetblsgroup.com
Estimate Prepared Date: 12/06/2016
Estimator Signature: _____ **Date:** 12/6/2016

Reviewer Information

Reviewer Name: Paul Scian
Reviewer Title: Principal Analyst/Hydrogeologist
Agency/Org./Office: The TBLS Group LLC
Business Address: 25 South Road
Telephone Number: (973) 750-1500, ext 2
Email Address: pauls@thetblsgroup.com
Date Reviewed: 12/06/2016
Reviewer Signature: _____ **Date:** 6 Dec 2016

Site Cost Summary Report
(with Markups)

Phase	Direct Cost	Markups	Total Cost
Study	$239,095	$357,250	$596,345
Design	$30,000	$0	$30,000
Remedial Action	$103,311	$56,090	$159,401
Operations & Maintenance	$879,044	$434,435	$1,313,479
Long Term Monitoring	$346,877	$386,430	$733,307
Site Closeout	$97,239	$76,448	$173,687
Total Site Cost	$1,695,565	$1,310,654	$3,006,219

EXHIBIT 21

All Preferences Report

System:

RACER Version: RACER® Version 11.3.18.0
Database Location: C:\Users\hhhoratio\Documents\RACER 11.3\RACER.mdb

Level Names

	Default Names	User Names
Level 1 Name:	Project	Project
Level 2 Name:	Site	Site
Level 3 Name:	Phase	Phase

Level 1 Categories

None

Level 2 Types

None
AOC
SWMU
Contaminant Specific
Off-Site
Site-Wide

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All Preferences Report

Location Modifier

State/Country NEW JERSEY
City NEW JERSEY STATE AVERAGE

Location Modifier

System Default	User Override
1.2100	1.2100

Comments:

Phase Safety Levels

Phase	Default Safety Level	User Safety Level
Pre Study	E	E
Study	D	C
Design	E	E
Removal/Interim Action	D	C
Remedial Action	D	C
Operations & Maintenance	D	D
Long Term Monitoring	D	D
Site Closeout	D	D

Comments:

All Preferences Report

Productivity

	Labor		Equipment	
	Default	User	Default	User
A	25 %	25 %	50 %	50 %
B	42 %	42 %	60 %	60 %
C	55 %	55 %	75 %	75 %
D	82 %	82 %	100 %	100 %
E	100 %	100 %	100 %	100 %

Comments:

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All Preferences Report

Markup Templates

New Markup Template	Markup Percentage
Professional Labor Overhead/G&A	132.0
Field Office Overhead/G&A	25.0
Subcontractor Profit	8.0
Prime Profit	8.0
Contingency	35.0
Owner Cost	11.0

Comment: Created 9/8/2016 contingency added as project is at remedial investigation stage

System Defaults	Markup Percentage
Professional Labor Overhead/G&A	132.0
Field Office Overhead/G&A	25.0
Subcontractor Profit	8.0
Prime Profit	8.0
Contingency	0.0
Owner Cost	11.0

Comment:

All Preferences Report

No-Markup Assemblies

Assembly	Description
32039005	Remedial Design - User Defined Cost
33010104	Sample collection, vehicle mileage charge, car or van
33010105	Sample collection, vehicle mileage charge, pickup truck
33010106	Sample collection, vehicle mileage charge, flatbed truck
33010202	Per Diem (per person)
33041101	Airfare
33220149	Lump Sum Percentage Labor Cost
33440201	Other RAB Costs
33440202	TAPP Support Costs
33440301	Cost of Consultant (Lump Sum)
33440302	Other Cost (Lump Sum)

All Preferences Report

Assembly Cost Database

Assembly	Description	Materials Cost	Labor Cost	Equipment Cost	SubBid Cost
33040683	Truckable Workboat, Near Shore and Inland Waters, Inboard Motor, 25' x 10', Daily Rental	.00	.00	886.52	.00
	Comments: Assumes 24-HR use period				
33040685	Underwater UXO Recovery Equipment, Daily Rental	.00	.00	627.18	.00
	Comments:				
33040697	Tractor, Agricultural, Wheel, 40-55 HP, 4x4, PTO, 3 Point Hitch	.00	.00	90.52	.00
	Comments:				
33040698	Offshore Marine Workboat, 58-FT Length 21-FT Beam, Daily Rental	.00	.00	3,499.72	.00
	Comments: Assumes 24-Hour Use Period				
33040941	Outside Diver	.00	119.24	.00	.00
	Comments:				
33040942	Diver Tender	.00	61.98	.00	.00
	Comments:				
33040943	Work Boat Operator	.00	63.57	.00	.00
	Comments:				
33040944	Fuel Truck and Driver	.00	8,425.86	5,587.53	.00
	Comments:				
33040945	Work Boat Assistant Operator	.00	64.07	.00	.00
	Comments:				
33040946	Community Relations Specialist	.00	69.93	.00	.00
	Comments:				
33041005	Perforator Explosive Charge	6.00	.00	.00	.00
	Comments: Cost provided by USACE Omaha EM/CX				
33041301	Munitions Response Workplan (Low Complexity)	80.00	9,563.76	.00	.00
	Comments:				
33041302	Munitions Response Workplan (Moderate Complexity)	80.00	12,849.90	.00	.00
	Comments:				
33041303	Munitions Response Workplan (High Complexity)	80.00	16,133.55	.00	.00

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All Preferences Report

Assembly	Description	Materials Cost	Labor Cost	Equipment Cost	SubBid Cost
	Comments:				
33041304	Explosive Safety Submission (Low Complexity)	160.00	16,162.09	.00	.00
	Comments:				
33041305	Explosive Safety Submission (Moderate Complexity)	160.00	21,510.92	.00	.00
	Comments:				
33041306	Explosive Safety Submission (High Complexity)	160.00	26,859.75	.00	.00
	Comments:				
33041313	Site Specific Final Report (Low Complexity)	80.00	12,315.36	.00	.00
	Comments:				
33041314	Site Specific Final Report (Moderate Complexity)	160.00	16,812.47	.00	.00
	Comments:				
33041315	Site Specific Final Report (High Complexity)	240.00	22,962.47	.00	.00
	Comments:				
33041316	MEC RI/FS Work Plan (Low Complexity)	600.00	33,790.42	.00	.00
	Comments:				
33041317	MEC RI/FS Work Plan (Moderate Complexity)	600.00	46,337.61	.00	.00
	Comments:				
33041318	MEC RI/FS Work Plan (High Complexity)	600.00	59,422.93	.00	.00
	Comments:				
95010001	Cost to treat insitu	.00	.00	.00	.00
	Comments:				
95010002	Oxidant	.00	.00	.00	.00
	Comments:				

Analysis Rates

Analysis Rate Group:

Assembly	Description	Analysis Rate	System Rate

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All Preferences Report

Analytical Templates

Analytical Template: **MNA Soil - Fuels** **Media:** Soil

Assembly	Description
33021732	Testing, soil & sediment analysis, total petroleum hydrocarbons (TPH)
33021744	Testing, soil & sediment analysis, pH, electrometric (9045)
33021746	Testing, soil & sediment analysis, total organic carbon (16.3)
33021754	Testing, soil & sediment analysis, chloride, titrimetric (9252)
33021776	BTEX/MTBE/TVPH (EPA 8021B/8015B), Soil Analysis

Comment:

Analytical Template: **MNA Soil - VOCS** **Media:** Soil

Assembly	Description
33021720	Testing, purgeable organics (624, 8260)
33021744	Testing, soil & sediment analysis, pH, electrometric (9045)
33021746	Testing, soil & sediment analysis, total organic carbon (16.3)
33021754	Testing, soil & sediment analysis, chloride, titrimetric (9252)

Comment:

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All Preferences Report

Analytical Template: **MNA Water - Fuels** **Media:** Water

Assembly	Description
33021602	Testing, soil & sediment analysis, pH, electrometric (9045)
33021603	Testing, dissolved solids
33021608	Testing, nitrogen, nitrate/nitrite
33021609	Testing, acidity/alkalinity
33021653	Testing, chloride
33021663	Testing, dissolved oxygen (DO)
33021668	Testing, sulfur: sulfate, sulfide, sulfite
33021673	Testing, total organic carbons
33021694	Total Petroleum Hydrocarbons (SW8015B), Water Analysis
33022134	Testing, PAH (SW3510/SW8310)
33022150	BTEX/MTBE/TVPH (EPA 8021B/8015B), Water Analysis
33022153	Dissolved gases (EPA RSK-175)

Comment:

Analytical Template: **MNA Water - Metals** **Media:** Water

Assembly	Description
33021602	Testing, soil & sediment analysis, pH, electrometric (9045)
33021603	Testing, dissolved solids
33021608	Testing, nitrogen, nitrate/nitrite
33021609	Testing, acidity/alkalinity
33021620	Testing, TAL metals (6010/7000s)
33021663	Testing, dissolved oxygen (DO)
33021668	Testing, sulfur: sulfate, sulfide, sulfite

Comment:

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All Preferences Report

Analytical Template: **MNA Water - VOCs** **Media:** Water

Assembly	Description
33021602	Testing, soil & sediment analysis, pH, electrometric (9045)
33021603	Testing, dissolved solids
33021608	Testing, nitrogen, nitrate/nitrite
33021609	Testing, acidity/alkalinity
33021618	Testing, purgeable organics (624, 8260)
33021653	Testing, chloride
33021663	Testing, dissolved oxygen (DO)
33021668	Testing, sulfur: sulfate, sulfide, sulfite
33021673	Testing, total organic carbons
33022153	Dissolved gases (EPA RSK-175)

Comment:

Analytical Template: **PFOA** **Media:** Water

Assembly	Description
33029501	User Defined Analysis 1

Comment:

Analytical Template: **System - Wastewater Effluent** **Media:** Water

Assembly	Description
33021670	Metals Screen, 25 Metals Listed In Method EPA 200.7, Water Analysis
33021694	Total Petroleum Hydrocarbons (SW8015B), Water Analysis
33021721	Testing, semi-volatile organics (625, 8270)
33022139	Testing, BTEX/MTBE (mod EPA 602)

Comment:

Analytical Template: **System Air - Asbestos** **Media:** Air

Assembly	Description
16029013	OSHA Testing, cleaned area samples, PCM air sample analysis, NIOSH 7400, minimum

Comment:

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All Preferences Report

Analytical Template: **System Air - Fuels** **Media:** Air

Assembly	Description
33021832	Testing, non-rad lab tests, hydrocarbon speciation C1-C22 to-12/14

Comment:

Analytical Template: **System Air - Metals** **Media:** Air

Assembly	Description
33021809	Testing, non-rad lab tests, multi-metal train, various methods

Comment:

Analytical Template: **System Air - PCBs** **Media:** Air

Assembly	Description
33021810	Testing, non-rad lab tests, pesticides/PCBs, various methods

Comment:

Analytical Template: **System Air - Pesticides** **Media:** Air

Assembly	Description
33021810	Testing, non-rad lab tests, pesticides/PCBs, various methods

Comment:

Analytical Template: **System Air - SVOCs** **Media:** Air

Assembly	Description
33021808	Testing, non-rad lab tests, semivolatiles 10/3550/8270

Comment:

Analytical Template: **System Air - VOCs** **Media:** Air

Assembly	Description
33021803	Testing, non-rad lab tests, tentative id of compounds GC/MS 30/5040/8240

Comment:

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All Preferences Report

Analytical Template: **System Air Emissions - Metals** **Media:** Air

Assembly	Description
33021809	Testing, non-rad lab tests, multi-metal train, various methods

Comment:

Analytical Template: **System Air Emissions - Pesticides/PCBs** **Media:** Air

Assembly	Description
33021821	Testing, non-rad lab tests, organochlorine pesticides/PCBs to-4

Comment:

Analytical Template: **System Air Emissions - SVOCs** **Media:** Air

Assembly	Description
33021828	Testing, non-rad lab tests, polyaromatic hydrocarbons to-13

Comment:

Analytical Template: **System Air Emissions - VOCs** **Media:** Air

Assembly	Description
33021803	Testing, non-rad lab tests, tentative id of compounds GC/MS 30/5040/8240
33021834	Volatile Organic Compounds (TO-14)

Comment:

Analytical Template: **System Soil - Acids/Caustics** **Media:** Soil

Assembly	Description
33021744	Testing, soil & sediment analysis, pH, electrometric (9045)

Comment:

This report for official U.S. Government use only.

All Preferences Report

Analytical Template: System Soil - Asbestos **Media:** Soil

Assembly	Description
33021779	Asbestos in Bulk Solids/Soils (Identification by PLM)

Comment:

Analytical Template: System Soil - Fuels **Media:** Soil

Assembly	Description
33021722	Polynuclear Aromatic Hydrocarbons(PAH) (SW 8310),w/prep, Soil Analysis
33021732	Testing, soil & sediment analysis, total petroleum hydrocarbons (TPH)
33021776	BTEX/MTBE/TVPH (EPA 8021B/8015B), Soil Analysis

Comment:

Analytical Template: System Soil - Geotechnical (Hydraulic) **Media:** Soil

Assembly	Description
33021103	Soil testing, Atterberg limits, liquid and plastic limits
33021120	Soil testing, Specific gravity, ASTM D 354
33021121	Soil testing, permeability test, double ring infiltrometer

Comment:

Analytical Template: System Soil - Geotechnical (Mechanical) **Media:** Soil

Assembly	Description
33021101	Geotechnical Characteristics Analysis
33021116	Soil testing, Shear tests, direct shear, ASTM D 3080, minimum
33021117	Soil testing, Shear tests, direct shear, ASTM D 3080, maximum
33021118	Soil testing, Shear tests, triaxial, minimum
33021119	Soil testing, Shear tests, triaxial, maximum
33021122	Soil testing, Consolidation test, ASTM D2435, minimum
33021123	Soil testing, Consolidation test, ASTM D2435, maximum

Comment:

All Preferences Report

Analytical Template: **System Soil - Herbicides** **Media:** Soil

Assembly	Description
33021719	Testing, soil & sediment analysis, chlorinated phenoxy acid herbicides EPA 8150

Comment:

Analytical Template: **System Soil - Low Level Radioactive** **Media:** Soil

Assembly	Description
33022336	Testing, rad analytical vegetation/sediment/soil, gas flow proportional counting, gross beta-total
33022351	Testing, rad analytical vegetation/sediment/soil, liquid scintillation, tritium

Comment:

Analytical Template: **System Soil - Metals** **Media:** Soil

Assembly	Description
33021709	Testing, TAL metals (6010/7000s)

Comment:

Analytical Template: **System Soil - Multi-Contaminant** **Media:** Soil

Assembly	Description
33021709	Testing, TAL metals (6010/7000s)
33021717	Pesticides/PCBs (SW 3550B/SW 8081/8082), Soil Analysis
33021719	Testing, soil & sediment analysis, chlorinated phenoxy acid herbicides EPA 8150
33021720	Testing, purgeable organics (624, 8260)
33021721	Testing, semi-volatile organics (625, 8270)
33021803	Testing, non-rad lab tests, tentative id of compounds GC/MS 30/5040/8240

Comment:

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All Preferences Report

Analytical Template: **System Soil - Ordnance Residual** **Media:** Soil

Assembly	Description
33021710	Testing, soil & sediment analysis, metals (1 cp) (6010)
33022401	14 Nitroaromatic/Nitramine Compounds by EPA Method 8330

Comment:

Analytical Template: **System Soil - PCBs** **Media:** Soil

Assembly	Description
33021783	PCBs in Soil (Method SW8082)

Comment:

Analytical Template: **System Soil - Perchlorate** **Media:** Soil

Assembly	Description
33021784	Perchlorate in Soil by EPA Method 6850/6860

Comment:

Analytical Template: **System Soil - Pesticides** **Media:** Soil

Assembly	Description
33021782	Pesticides in Soil (Method SW8081)

Comment:

Analytical Template: **System Soil - SVOCs** **Media:** Soil

Assembly	Description
33021721	Testing, semi-volatile organics (625, 8270)

Comment:

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All Preferences Report

Analytical Template: **System Soil - VOCs** **Media:** Soil

Assembly	Description
33021720	Testing, purgeable organics (624, 8260)

Comment:

Analytical Template: **System Water - Acids/Caustics** **Media:** Water

Assembly	Description
33021609	Testing, acidity/alkalinity
33021757	Testing, RCRA evaluations, corrosivity, ignitability & reactivity, corrosivity (1110, NACE)

Comment:

Analytical Template: **System Water - Fuels** **Media:** Water

Assembly	Description
33021694	Total Petroleum Hydrocarbons (SW8015B), Water Analysis
33022134	Testing, PAH (SW3510/SW8310)
33022150	BTEX/MTBE/TVPH (EPA 8021B/8015B), Water Analysis

Comment:

Analytical Template: **System Water - Herbicides** **Media:** Water

Assembly	Description
33022149	Testing, chlorinated phenoxy herbicides (SW3510/SW8150)

Comment:

Analytical Template: **System Water - Low Level Radioactive** **Media:** Water

Assembly	Description
33022257	Testing, rad analytical liquid, gas flow proportional counting, gross beta-total
33022284	Testing, rad analytical, liquid scintillation, tritium (direct counting)

Comment:

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All Preferences Report

Analytical Template: **System Water - Metals** **Media:** Water

Assembly	Description
33021603	Testing, dissolved solids
33021604	Testing, suspended solids
33021620	Testing, TAL metals (6010/7000s)

Comment:

Analytical Template: **System Water - Multi-Contaminant** **Media:** Water

Assembly	Description
33021603	Testing, dissolved solids
33021604	Testing, suspended solids
33021620	Testing, TAL metals (6010/7000s)
33021803	Testing, non-rad lab tests, tentative id of compounds GC/MS 30/5040/8240
33022131	Testing, purgeable halocarbons (SW5030/8010)
33022133	Testing, pesticides/PCBs (SW3510/SW8080)
33022135	Testing, base neutral & acid extractable organics (SW3510/SW8270)
33022149	Testing, chlorinated phenoxy herbicides (SW3510/SW8150)

Comment:

Analytical Template: **System Water - Ordnance Residual** **Media:** Water

Assembly	Description
33022401	14 Nitroaromatic/Nitramine Compounds by EPA Method 8330

Comment:

Analytical Template: **System Water - PCBs** **Media:** Water

Assembly	Description
33022155	PCBs in Water (Method SW8082)

Comment:

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All Preferences Report

Analytical Template: **System Water - Perchlorate** **Media:** Water

Assembly	Description
33021695	Perchlorate in Water by EPA Method 6850/6860

Comment:

Analytical Template: **System Water - Pesticides** **Media:** Water

Assembly	Description
33022154	Pesticides in Water (Method SW8081)

Comment:

Analytical Template: **System Water - SVOCs** **Media:** Water

Assembly	Description
33022135	Testing, base neutral & acid extractable organics (SW3510/SW8270)

Comment:

Analytical Template: **System Water - VOCs** **Media:** Water

Assembly	Description
33021618	Testing, purgeable organics (624, 8260)

Comment:

Analytical Template: **UST Air - Fuels** **Media:** Air

Assembly	Description
33021807	Testing, non-rad lab tests, BETX /total volatile petro hydrocarbs 5040/8020/8015

Comment:

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All Preferences Report

Analytical Template: **UST Soil - Fuels** **Media:** Soil

Assembly	Description
33021732	Testing, soil & sediment analysis, total petroleum hydrocarbons (TPH)
33021776	BTEX/MTBE/TVPH (EPA 8021B/8015B), Soil Analysis

Comment:

Analytical Template: **UST Water - Fuels** **Media:** Water

Assembly	Description
33022150	BTEX/MTBE/TVPH (EPA 8021B/8015B), Water Analysis

Comment:

Analytical Template: **Waste Characterization, Liquid** **Media:** Water

Assembly	Description
33021620	Testing, TAL metals (6010/7000s)
33021717	Pesticides/PCBs (SW 3550B/SW 8081/8082), Soil Analysis
33021719	Testing, soil & sediment analysis, chlorinated phenoxy acid herbicides EPA 8150
33021720	Testing, purgeable organics (624, 8260)
33021739	Testing, semi-volatile organics, pkd. column (8250)
33021756	Testing, RCRA evaluations, corrosivity, ignitability & reactivity, ignitibility (1010)
33021757	Testing, RCRA evaluations, corrosivity, ignitability & reactivity, corrosivity (1110, NACE)
33021758	Testing, RCRA evaluations, corrosivity, ignitability & reactivity, reactivity (cyanide/sulfide)

Comment:

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All Preferences Report

Analytical Template: Waste Characterization, Solids **Media:** Soil

Assembly	Description
33021620	Testing, TAL metals (6010/7000s)
33021702	TCLP (RCRA) (EPA 1311), Soil Analysis
33021717	Pesticides/PCBs (SW 3550B/SW 8081/8082), Soil Analysis
33021719	Testing, soil & sediment analysis, chlorinated phenoxy acid herbicides EPA 8150
33021720	Testing, purgeable organics (624, 8260)
33021739	Testing, semi-volatile organics, pkd. column (8250)
33021750	Testing, paint filter liquids test (9095)
33021756	Testing, RCRA evaluations, corrosivity, ignitability & reactivity, ignitibility (1010)
33021757	Testing, RCRA evaluations, corrosivity, ignitability & reactivity, corrosivity (1110, NACE)
33021758	Testing, RCRA evaluations, corrosivity, ignitability & reactivity, reactivity (cyanide/sulfide)

Comment:

Professional Labor Rates

Professional Labor Rate Group:

Assembly	Description	Labor Rate	System Rate

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